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December 26, 1932

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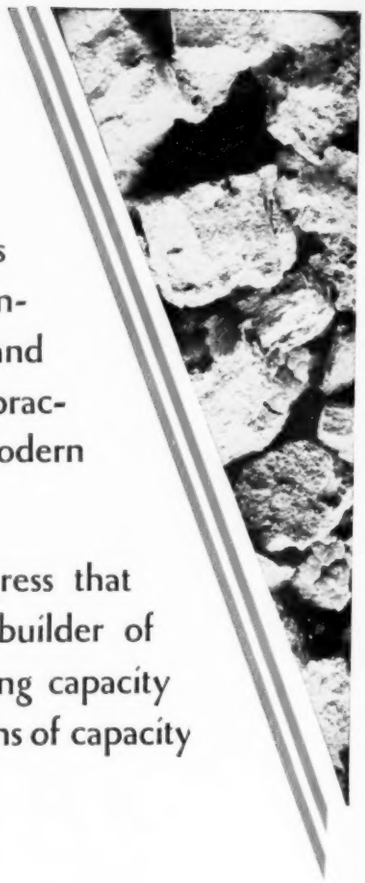

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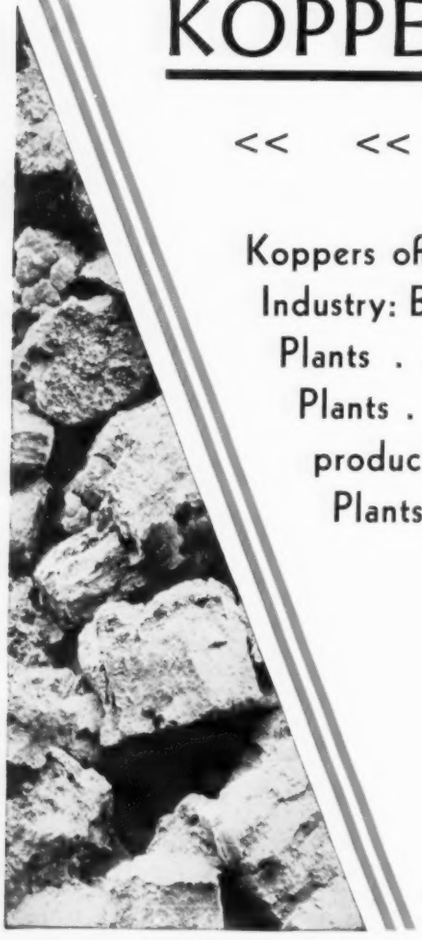

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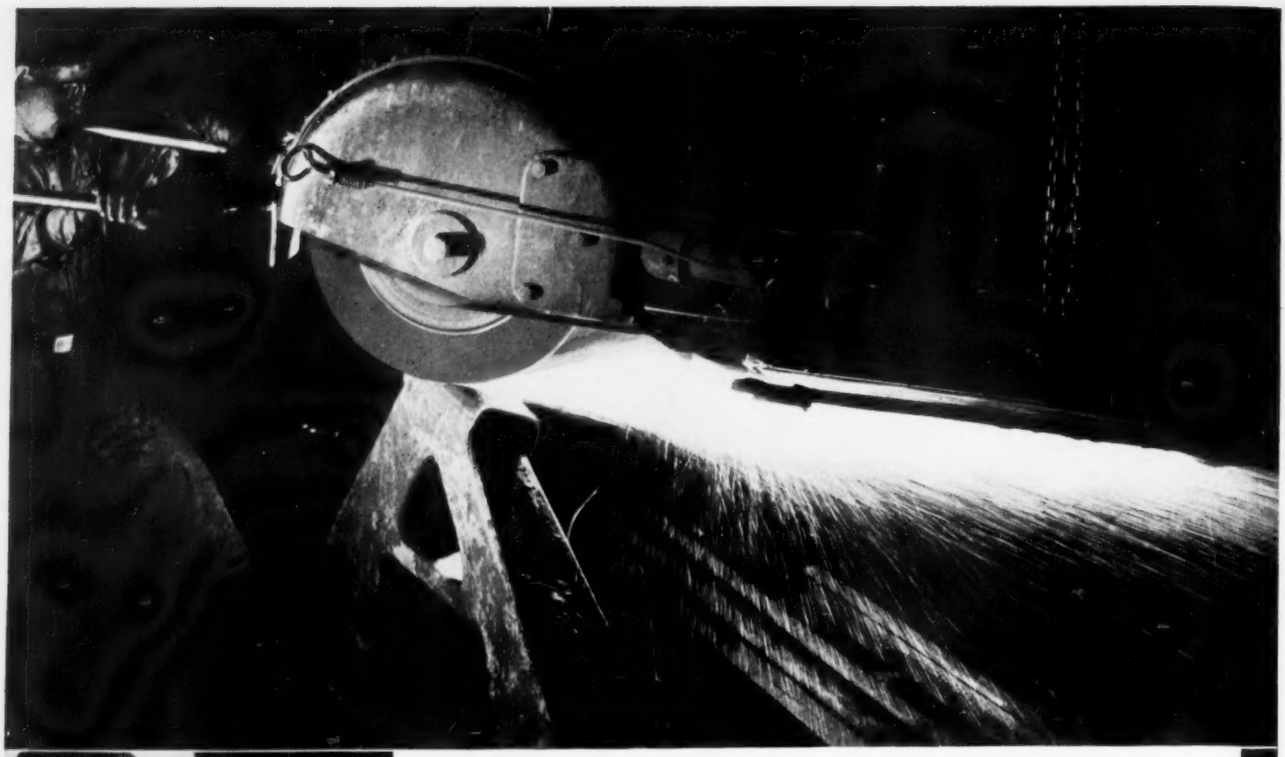

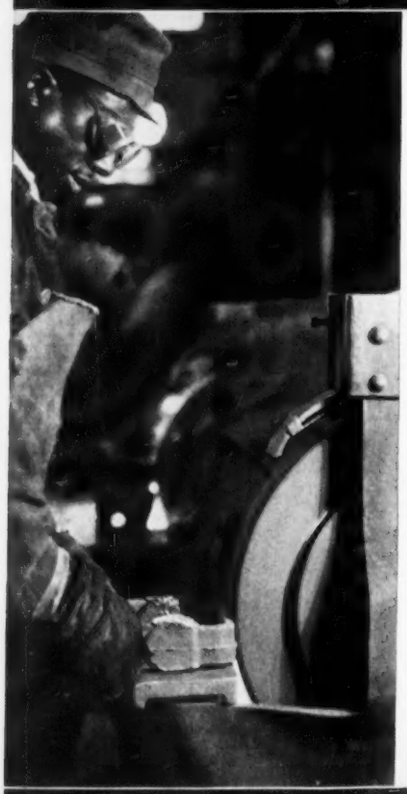

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BAKELITE BONDED

Volume 91 Number 26

STEEL

For forty-eight Years—IRON TRADE REVIEW

PRODUCTION • PROCESSING • DISTRIBUTION • USE

The Week in Perspective

WHILE part of the iron and steel industry favors repeal of prohibition, for whatever benefit might accrue from demand for brewery equipment, the entire industry would approve repealing all holidays. It was during the July 4 week that steel production descended to an average of 12 per cent—a low for modern times. For a month now, the industry has been pointing to Christmas, and the cessation over last week-end at least equaled the July 4 fadeout (p. 33). Although New Year is not an official holiday for the industry, its observance by consumers practically makes it one. But after that begins a period of five months which, regardless of what other vicissitudes it may have in store, at least is without the hazard of a single holiday.

Stainless Makers Prepare for Foaming Market

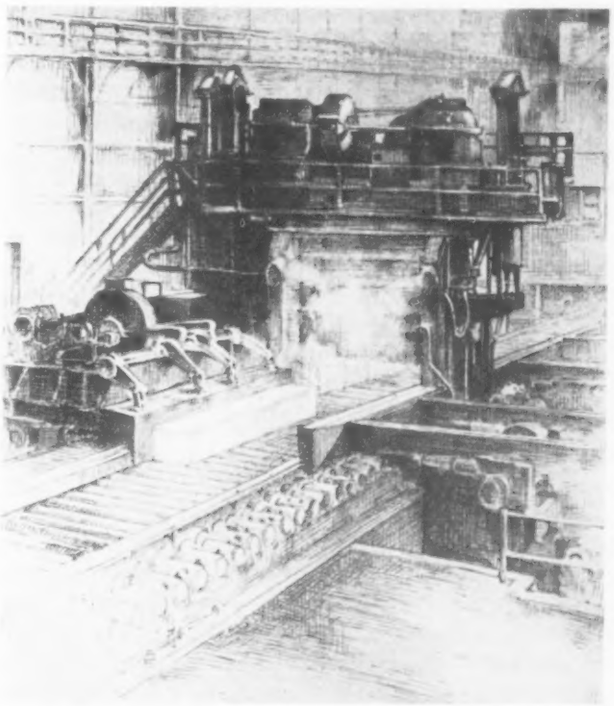
With the house of representatives voting for 3.2 per cent beer, producers and fabricators of chrome-nickel, or stainless, steel are the more assiduous in preparing for an expected brisk market. A large percentage of the 1200 breweries in operation in 1917 are prospective buyers of vats, storage tanks, barrels, coils, syphons, measuring vessels, fittings and other brewery accessories, it is believed (p. 21). Notwithstanding success with this alloy in England and Germany, Americans must be convinced by tests here. . . . In Germany, the production of stainless steel kegs for beer increased (p. 50) from 1164 units in 1925 to 15,235 in 1929, falling back to 14,453 in 1930. In this role, steel is the successor of oak.

Keg or Bottle, Decision Is Vital to Trucks

Truck manufacturers also are in receptive mood, much interested whether beer returns in kegs or bottles, which will determine the type of transportation required (p. 11). Prosaic as trucks may appear, the most radical departure mechanically in motor vehicles at the New York show will turn up in this field. A light delivery truck will be axleless, the wheels being hung independently, and the power plant mounted in the rear, where it may be detached pronto. Other automobile gossip (p. 11) is that the new Willys four and six-cylinder "New era" models will be fully Europeanized as to streamlining, the Hudson super-six is coming back, Ford continues to order material for his new line, something more to look out for on the highways is a 36-ton tractor truck.

Electric Eye Directs Plant Traffic

A localized form of transportation was handicapped when loaded tote pans in the plant of bolt and nut manufacturer piled up at the junction of a gravity conveyor. Now, when a pan fails to slide along on schedule a photoelectric relay (p. 26) stops the loading mechanism until the congestion is cleared up. . . .



The activity depicted in this Christmas card of the United Engineering & Foundry Co., Pittsburgh, would make an acceptable gift to any steel producer or workman

Seven thousand concrete piles support this 500-ton blast furnace for Ford Motor Co. at Dagenham, Eng., designed by the Freyn Engineering Co., Chicago, and erected by its British associates—Ashmore, Benson, Pease & Co. Ltd.

Many sheet mill automatic catcher tables also are equipped (p. 30) with photoelectric tubes which control the conveyor lift motion. . . . Daily average sheet sales, production and shipments of independent mills were lower (p. 12) in November than October. . . . Substantial releases of automotive requirements (p. 34) make the holiday shutdown of sheet mills shorter than that of other departments of the industry.

May End Advantage of Debased Currency

Marshaling reinforcements for the dollar as well as for home industry, a bill (p. 12) in congress would exactly balance with an import tax any preference of foreign commodities accruing from the higher value of the dollar. . . . But viewed from the standpoint of domestic trade, the dollar is too dear, or, as an economist puts it (p. 7), commodity prices must rise before business can recover. . . . In Great Britain, business appears noticeably better, according to the London cable (p. 47), Continental competition decreasing and home employment increasing that much. Australia, Argentina and Russia are greator factors in the export market.

200 Degrees Is Only the Difference

A 125-ton basic open-hearth steel furnace whose roof insulation had withstood 456 heats showed (p. 22) a temperature 200 degrees lower than a portion of the roof not insulated. . . . Elimination of some inclusions is claimed (p. 30) by an open-hearth plant at which an auxiliary ladle is employed at the pouring station to reduce the ferrostatic pressure. . . . In pursuing economical production of steel castings a knowledge of characteristics and behavior of steel in molds is vital (p. 19). Abrupt changes in cross section handicap the making of good castings.

The VOICE of INDUSTRY

Communications appearing here do not necessarily reflect the opinion of STEEL *or of its editors.*

Depreciated Currency vs U. S. Dollars

To the Editor:

Certain developments of the past few days offer more encouragement than anything which has happened during the past couple of years.

One of these developments is the admission by Mr. Whitney of the New York stock exchange that America's most serious debt problems are domestic rather than foreign. This admission I hope will result in some serious attention being directed to our domestic debts.

Also in one of the recent issues of *Daily Metal Trade* mention is made of the fact that we can anticipate a continuation of the decline in American exports unless something is done to correct the situation which exists in the various countries which have abandoned the gold standard. Imports from these countries that have debased their currency will tend to increase at very low prices. This is again recognizing the fact our high United States dollar value is the one and all important factor responsible for our present-day low exports.

B. C. Forbes in a recent press article calls attention to "Depreciated foreign currencies are enabling foreign competition to overcome American tariffs in a way not taken into reckoning by our tariff makers. This depreciation has gone extraordinarily far in several countries important as industrial competitors with the United States." Viewing this from the standpoint of depreciated foreign currencies is the same as viewing it from the appreciated United States dollar viewpoint.

The suggestion that we remit or revise foreign debts for the purpose of enabling foreign countries to purchase American merchandise is about as consistent as the policy of making additional loans to foreign governments a few years back so they would in turn make payments on the amounts owing us. Unfortunately the additional loans in most cases exceeded the amounts repaid.

If, due to the high value of the dollar and the low value of the foreign currencies, it is more economical to purchase foreign merchandise now, what will prevent this same condition continuing even if the debts are remitted and what assurance can there be that Europe will purchase a greater amount of American merchandise after the debts are reduced than now?

If our leaders should consider it advisable to subsidize a purchasing power in order to revive business, why not subsidize our own people, in which case we can be reasonably certain that the money will be spent in our own country?

It is my opinion, based on experience derived from coming in contact with European competition in the sale of merchandise, unless the currency values are adjusted our common labor basis will return to the basis of 10 cents and 15 cents per hour, which will mean a labor rate of about 25 cents for carpenters and other trades in proportion.

Summing up the entire problem it is demonstrated that one of the major difficulties which the foreign nations are facing in liquidating their obligations to our country is the depreciated value of their currency or in other words the appreciated value of our dollar. This is the major factor in continuing our low volume of export trade and is the major difficulty in the liquidation of our internal debts, both public and private. Why not, therefore, correct this major cause of our troubles by revaluing our United States dollar?

L. E. Kinn, President and General Manager,
The Seneca Wire & Mfg. Co.

Fostoria, O.

Rise in Commodity Values Is Essential to Prosperity

By C. L. PERRY

TO OBTAIN a clear understanding of any subject it is necessary to have, first, an analysis of the factors involved and, second, a knowledge of their relative importance.

That such an understanding of factors in buying power for industrial products has been lacking is evident from discussions of the present business depression and the remedies for it. Fundamentally, nine chief factors control the entire situation:

1. Commodity values as source
2. Rent
3. Exports
4. Building and construction
5. Income from securities
6. International debts
7. Taxes and other government income
8. Transportation
9. Industrial payrolls, in which must be included selling and distribution expenses

Before discussing them in detail however, there are three points to consider, on which this analysis is based.

First: Accurate data on manufactures and retail sales in the United States are available for 1929, but for 1930 and 1931 they will not be available for some time.

Omit Food Consumption Data

Second: Since total consumption of food does not vary greatly in our country in good times or bad the problem can be simplified by omitting from the total value of manufactures prepared foods, and we can then use as a purchasing unit the proportion of the average family income devoted to other manufactures. This value averages about 30 per cent and includes clothing, house furnishings and many minor items.

Third: An analysis of retail prices shows that about 65 per cent lies in payrolls when business is normal, so that only about 20 per cent of value of the products of industry can be consumed by industrial payrolls. Who buys the remainder?

The United States census report for 1929 shows our retail trade to have been about $53,000,000,000, and of this amount the food bill was about $11,000,000,000, leaving about $42,000,000,000 for other products. In 1930 this balance was about $5,000,000,000 less, which we must try to account for, leading us to a discussion of commodity values.

Commodities include all agricultural and mineral products of the earth. We find there was a decline from 1929 to 1930 in the value at the farms of all crops of about $2,500,000,000. The loss on poultry and livestock was nearly $1,000,000,000 more. Loss on fuel, including coal and crude oil, was about $450,000,000, and on copper and other metals about $500,000,000.

Effects of these losses spread rapidly and produced a decline in payrolls in 1930 of possibly $2,000,000,000 more. We, therefore, began the year 1931 with a serious handicap which was further aggravated by the continued fall in commodity prices. Let us now consider in more detail the relationship of the other factors.

Rent—Rents remained almost unchanged during 1930, and had an estimated value of $8,250,000,000. They began falling about the middle of 1931, and do not yet seem to be adjusted. Rent can be divided into four items: Taxes, 25 per cent; interest charges on property, 25 per cent; maintenance, 20 per cent; net income, 30 per cent. Taxes and interest tend to remain constant and maintenance fall slowly, so that income falls rapidly with lower rent.

Exports—In 1930 our exports fell off somewhat in value though the volume was nearly normal. Total value of our commodity exports was about $2,000,000,000, equal to about 4 per cent of our national retail sales, or about 10 per cent of the value of our commodity production. Here again we find an important variable in buying power, for 10 per cent is large enough to be a factor in prices. We export about 40 per cent of our cotton.

Exports of manufactured goods also remained fairly high, but being less than 5 per cent of our total product they were not, and except during the World war, have never been as a whole a controlling factor in prices.

Building and construction—Building and construction in 1930 fell to about $6,000,000,000 from a maximum of about $7,000,000,000. Here we have another variable, composed in normal years of about equal public and private expenditures.

Our national government's expenditures for public projects were somewhat less than $1,000,000,000 annually for several years. They were, therefore, by no means a dominating factor in industry, nor can we so consider the total, including state and local projects, though they serve as stabilizers. Building and construction from private funds, however, are among the most variable factors.

If we assume the normal total to be $7,000,000,000 from all sources, and the probable reduction in 1931 to be $2,000,000,000, the loss in private property was nearly 60 per cent. About half this amount was loss in purchases of building materials and considerable in purchases of manufactures due to unemployment.

Income from securities—Income

Decline in Factors Affecting Buying Power

	Millions of dollars		
	1929	1930	1931
1. Commodities:			
Agricultural	$12,300	$8,500	$6,100
Mineral, including oil and gas	5,887	4,800	3,000
2. Rent, Total	8,250	8,250	7,500
Taxes 25% of 1929 value	2,125	2,125	2,125
Interest charges	2,125	2,125	2,125
Maintenance charges	1,650	1,650	1,500
Net income available for spending	2,550	2,350	1,750
3. Exports:			
Manufactures	3,230	2,410	
Grain and raw materials	1,900	1,370	Total 2,500
4. Building and construction:			
Federal, state and local governments	3,500	3,500	3,500
Corporation and other, including public utility	3,880	2,500	1,500
5. Investment income*:			
Dividends	4,400	4,400	3,700
Foreign securities	900	900	850
United States government	650	635	630
Other bonds	1,200	1,200	1,100
6. Depreciation of bonds†:			
Foreign government	16,500	16,200	10,000
Other bonds	18,000	18,000	14,000
7. Taxes paid:			
Federal	3,500	3,600	2,800
State and local	8,000	8,000	7,500
8. Railroad gross income	5,516	5,280	4,190
9. Available from all industrial payrolls	10,400	9,500	5,000

*Bond data based on New York stock exchange reports. †Depreciation, on New York stock exchange.

from domestic securities is another variable composed of a fairly constant factor, bond interest, and an erratic variable, dividends. The total value of dividends in 1929 and also in 1930 was $4,400,000,000, but these fell off violently in 1931 and 1932. To the loss in dividends must be added an unusually large loss in mortgage interest. The more stable factor, other domestic bond interest, has not fallen by any great amount, though bond values have had an unprecedented fall.

International debts—The people of the United States own about $16,000,000,000, par value, of foreign securities, mainly bonds, and would derive from them about $900,000,000 annually if all interest were being paid. In addition to this we should receive over $200,000,000 from World war debts.

The latter payments, in amount, therefore are only a minor factor in our national economics, their direct importance being chiefly in reducing our own national debt. Their indirect importance in reducing our exports has been probably much exaggerated, but in other ways their effect on our international relations admittedly has been very serious.

Our greatest financial losses from foreign loans, however, have not been due to defaults but to the fear of defaults which has caused unprecedented depreciation in foreign bond prices.

Taxes and other government income—Our federal government employs about 650,000 people and our state and local governments employ many thousand more. Our total taxes and other payments for government expenses amount to about $12,000,000,000 annually, of which nearly 35 per cent is for federal expenses, 14 per cent for state and county, and 51 per cent for local expenses.

About $650,000,000 is paid in interest by our federal government and for several years prior to 1931 about $700,000,000 more was paid on the principal of our debt. Probably very little of these amounts was used for the direct purchase of manufactures, but an analysis of the remainder of our federal expenditures seems to indicate that directly and indirectly, through federal employes, about $1,700,000,000 is so spent annually.

Of the $8,000,000,000 spent in 1930 by state and local governments about $2,000,000,000, or 25 per cent, went to banks and other holders of bonds for debt service; $3,000,000,000 for administrative and executive expenses; $1,000,000,000 for supplies, that is, for manufactures; and $2,000,000,000 for building and construction. But, of the $3,000,000,000 paid in salaries and wages only $900,000,000, or 30 per cent, was used for purchase of manufactures, the rest being used for food, rent and other family expenses.

We, therefore, can estimate that of the total taxes and moneys collected about $6,500,000,000 went back into industry, and at least an equal amount will be so used this year.

Transportation—Transportation, of course, includes other factors than steam railroad traffic; nevertheless, nearly 80 per cent of our country's bill for transportation was paid to the railroads. As a result, for several years prior to 1930 they paid out over $1,000,000,000 annually for construction work, and a total, annually, directly and indirectly, of about $3,500,000,000 for manufactures.

This huge sum has been cut enormously in the present depression; first, by the loss in buying power of the commodity producers and, second, by the lack of demand for building materials, fuel, machinery and other manufactures. Traffic has fallen more than 50 per cent and the results are so widespread as to be, next to commodity losses, perhaps the most important cause of unemployment.

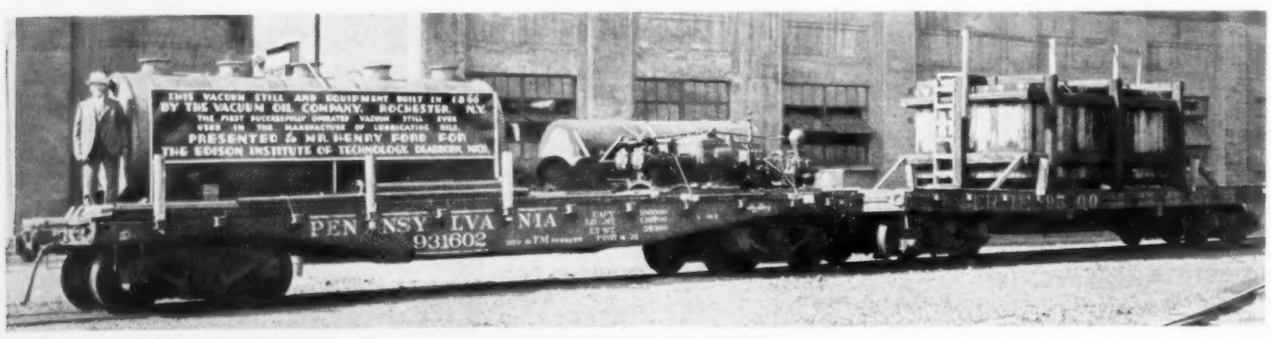
Industrial payrolls—As previously stated, the buying power of employes in industry is only about 20 per cent of sales. Sales to ultimate consumers appear to have been about $52,000,000,000, so that the purchasing capacity of industrial payrolls for all sales must have been about $10,400,000,000. This item fell only about 10 per cent during 1930, but probably more than 50 per cent later.

Conclusions—Our analysis seems, therefore, to show that the fall in commodity values in 1930 just about equalled the fall in the value of purchased manufactures, or about 10 per cent. This was followed by a further fall in commodity prices during most of 1931, resulting in a very great reduction in the buying power of the producers of commodities and the railroads, accompanied by unemployment in many lines, and a loss of income from securities that further intensified the situation. Only the textile, clothing and prepared food industries have been operating anywhere near full schedules, and the former seems to have profited to a considerable extent by the low prices for food—by no means a healthy condition.

Our wealth comes primarily from the earth and when we force it to yield beyond our needs there may be no profits. To date we have seen an important rise only in the prices of oil and live stock, but with that rise Texas and the southwestern portion of our country have been the first to show signs of recovery. Does not this further go to prove that a rise in commodity profits, however brought about, is essential to a return of prosperity?

One other factor, the rise in the value of bonds and investment securities, which has been greatly stimulated by our government's recent program for aiding business, may play a large part in restoring prosperity. A restoration of wealth from this source and from real estate values cannot, however, directly affect the prosperity of such large numbers of our people as a rise, for instance, in the value of crops or increased railroad income.

The table on Page 7 summarizes the decline in factors affecting buying power from 1929 to 1930, and as far as figures are available at present for 1931. Some of the figures



VACUUM OIL CO. has presented to the Edison Institute of Technology at Dearborn, Mich., sponsored by Henry Ford, the first commercial vacuum still for refining petroleum products. It is a 30-barrel still erected in 1866 at Rochester, N. Y., by Hiram B. Everest, founder of the Vacuum Oil Co. It has been unused for the past 40 years but was treasured as a memento. Dr. Florus R. Baxter, head of Vacuum's testing laboratories, who has been with the company more than 50 years, will be in charge of restoration of the old still exactly as first used. Other long-time employes who will assist in restoration are August J. Goebel, 59 years service, and Richard King, 52 years. The illustration shows the still in transit to Dearborn. Photo courtesy of National Petroleum News

for 1931 are only estimates but are probably conservative. It will be noted that the decline in commodity values preceded all the rest, and exceeds in amount any other.

Says R. F. C. Interest Too High To Boost Building

Declaring that high interest rates demanded by the Reconstruction Finance Corp. have delayed work on many self-liquidating projects, requiring large tonnages of steel, Charles F. Abbott, executive director of the American Institute of Steel Construction, New York, asserted that as money becomes more plentiful in banks and as private lending institutions realize the urgency of finding an outlet for idle funds, much of this work, estimated at $2,500,000,000, will go ahead. Mr. Abbott, who spoke before the Structural Steel Board of Trade of Philadelphia at the University club, held out little hope for immediate improvement but foresaw some big years ahead in the structural field.

Referring to activities of the Reconstruction Finance Corp., he declared that even the best of projects would not be undertaken if it were necessary to borrow money at 7 per cent for their building. That is why, he continued, so few self-liquidating projects have yet been financed under the emergency act of congress. That and the fact that the restricting provisions put into the law make it much easier and cheaper for the states to borrow money from the corporation for a "dole" instead. Direct relief money, "dole," can be had at only 3 per cent interest, Mr. Abbott remarked.

Easton Car Official For Buyers' Day or Week

An order day or week in furtherance of which every consumer would place an order for material which he could reasonably hope to move in a short time is proposed by W. E. Farrell, president, Easton Car & Construction Co., Easton, Pa., in a letter sent to the *Manufacturers' Record* recently.

"There are thousands of concerns which neither give nor receive an order a day, which have not received an order from an old and steady customer for months," Mr. Farrell points out.

"Even a small order would generate a new state of mind. We have days for everything—Labor day, Safety day, Father's day, in fact days or weeks for most everything. Why not now try a day with some meaning, some impetus to help our neighbor, and by helping him help ourselves!"

Traffic both ways in the Holland tunnel, New York, was stopped recently to permit passage of this "largest" commercial elevator platform—17 feet wide, 34 feet long, weighing 20,000 pounds—being transported from the Otis Elevator Co. in Harrison, N. J., to the new Inland Terminal building in Manhattan. This steel elevator will lift loaded trucks from the street level to upper floors

New England Shape Business Still Goes Outside; Crane Charge Not Yet Settled

BOSTON

NEW system of quoting on plain structural material, direct to site, has thus far failed materially to localize fabricating work in New England. The most attractive tonnages, mostly public work, continue to go to outside shops.

On a 550-ton Concord, N. H., bridge the low bidder quoted 3.44c for structural steel in place, while the most attractive New England shop bid was 3.69c.

However, cost of removing the old structure enabled the Buffalo district fabricator to come in low. The original structure was put up in the 20-year old there-to-stay plan.

An interesting detail is that the low bidder, the Lackawanna Steel Construction Corp., Buffalo, bid 3.00c on reinforcing steel and the second bidder, a Boston shop, 2.73c. For the substructure, close to 75 tons of steel sheet piling will be required.

□ □ □

Granite shippers made the most effective protest against the proposed 50-cent a ton charge for the use of a power crane and labor for loading and unloading material from freight cars, at the hearing at Boston, Dec. 20. This charge means 50 cents a ton on steel shipments, or a minimum charge of $5 per shipment.

Several steel shippers were represented at the hearing and spoke against the rate. No action was taken on the proposed rate. It was pointed out by one steel fabricator, that on large jobs such as the Boston postoffice, with steel shipped in bulk and quantity, such a charge would amount to as much as $200 a day and more for the use of a power crane and one man, the tackle to be adjusted by the shipper or receiver.

□ □ □

Few finished steel products have been hit harder during the depression than commercial steel bars. Consumers in the Providence and southern New England district have been buying few bars as bolt, nut and screw demand declined. Most consumers went into the depression with heavy stocks of bars, and for a long period have been operating not much better than 20 per cent. However, in most cases reserve stocks of bars have been depleted and with any turn upward the commercial steel bar business in New England may again be expected to go forward.

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Suggestion has been made by a special committee reporting to the Massachusetts state legislature that all state highway construction be halted during 1933 and the funds turned over for relief work. The committee was not unanimous in its report, and approval is not likely.

Industrial Men in the Day's News

J. Lester Perry, Vice President, American Steel & Wire Co.

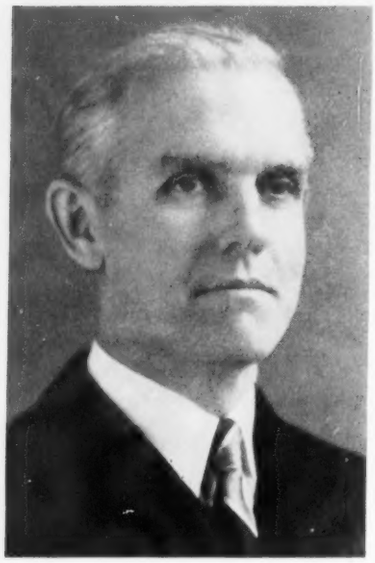

Photo by Gray

NATIVE of Worcester, Mass., he has served the Steel & Wire company there for more than 33 consecutive years.

SINCE 1928 he has been district manager at Worcester. Now he succeeds Charles F. Blackmer, who becomes president Jan. 1.

FROM Cleveland he will direct operations of the company in all districts. He also goes on the board of directors.

J. LESTER PERRY, manager of the Worcester, Mass., district of the American Steel & Wire Co., a subsidiary of the United States Steel Corp., has been elected a vice president of the company in charge of operations, effective Jan. 1. He succeeds Charles F. Blackmer who, on Jan. 1, becomes president in succession to John S. Keefe.

Mr. Perry was born in Worcester, March 11, 1881, and was educated in the grammar and high schools of that city. His record of continuous service with the Steel & Wire company dates from Aug. 4, 1899, when he became a clerk in the cost department. From that position he was advanced to the ledger manufacturing division, and in 1904 was promoted to general clerk.

In 1913 he was transferred to the operating department of the North works in Worcester, was foreman of the cold-rolling department until 1916, in the same year was made assistant superintendent of the North works and in 1917 was promoted to superintendent of the South works.

After one year at the South works he became superintendent of the North works, a post he held until 1925, when he was made assistant district manager at Worcester. On the retirement of Clinton S. Marshall as district manager in 1928, Mr. Perry succeeded him.

Mr. Perry, who is a member of the American Iron and Steel institute and has been president of the Worcester chamber of commerce, will have his headquarters in Cleveland. Mr. Perry automatically becomes a director of the company.

CLIFTON F. HOOD, assistant manager of the Worcester, Mass., district of the American Steel & Wire Co., on Jan. 1 becomes manager in succession to J. Lester Perry, who as noted above becomes vice president of the company in charge of operations, at Cleveland. Mr. Hood has been with the company since 1917, when he became a clerk in the cable department of the South works at Worcester. He is a graduate of the University of Illinois and has been assistant superintendent and superintendent of the South works.

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R. W. Hull, formerly Chicago district manager for Bourne-Fuller Co. and recently manager of sales at Chicago for the Upson division of Republic Steel Corp., Youngstown, O., has been appointed assistant sales manager of the Chicago office of the Republic corporation.

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J. E. Lewis, president, Harbison-Walker Refractories Co., Pittsburgh, has been elected president of the American Refractories institute.

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R. H. Ledbetter, general superintendent of the Ensley Works of the Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., has been made general superintendent of the Fairfield steelworks of the company, succeeding R. R. Baxter, resigned.

N. L. VanTol has been made superintendent of the Ensley Works, succeeding Mr. Ledbetter.

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William G. Gray, in charge of the statistical department of the American Iron and Steel institute, and associated with the institute and its predecessor, the American Iron and Steel association, since 1887, will retire on pension Dec. 31.

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Ray H. Morris has been appointed factory representative in the Connecticut teritory by Hardinge Bros. Inc. and Morrison Machine Products Inc., Elmira, N. Y.

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H. C. Green, for 13 years connected with the Gulf States Steel Co., Birmingham, Ala., practically all of this time as assistant to the purchasing agent, has been appointed purchasing agent of the company, effective Jan. 1. He succeeds B. F. Tyler, who died Dec. 2. Mr. Green is a graduate of the University of Chattanooga.

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David B. Carson, who has been

(*Please turn to Page* 37)

MIRRORS OF MOTORDOM

DETROIT

ESPECIALLY at this season does the flashy passenger automobile, refurbished in chassis and body, monopolize the limelight and make the phlegmatic truck appear the more workaday, yet it is safe to forecast that when all the new ideas incorporated in motor vehicles displayed at the New York show are assayed, a new type of truck will be adjudged the most radical.

As Detroit hears it, a manufacturer outside of this district will introduce a light delivery truck in which the axles are eliminated, the wheels are hung independently and the engine is mounted at the rear. This consolidates in one vehicle two departures in engineering on which some passenger car manufacturers are understood to have been experimenting.

In this axleless truck, several springs are mounted transversely in the front, steering arms being attached to both ends of one spring. Full details are not known concerning the rear assembly, but apparently the engine and transmission are integral. The wheels are believed to be attached to the ends of a transverse semielliptic spring, with the drive shaft slipping in between both rear wheels.

Steel Body for Lightness

Necessarily the body must be exceptionally strong for its weight, as the effect is to hang the wheels at the four corners. The body sides and top are understood to be sheet steel panels, making for lightness. Only one lever is said to be necessary for control. In case of breakdown, it is reported that the power plant can be removed, even on the road, in a few minutes and a spare substituted.

In sharp contrast to this axleless car is the unusually capacious but compact heavy duty tractor truck developed by the Four Wheel Drive Auto Co., Clintonville, Wis. Consisting of a tractor and two trailers, close coupled, a gross load of 72,000 pounds is possible. In a typical installation, one of these tractor trucks carries 7950 pounds on the front axle and 15,810 pounds on the rear. A 125-horsepower engine makes a speed of 38 miles per hour possible.

Following the decision of Studebaker to move its Pierce-Arrow truck division from Buffalo to its newly-acquired White Co. plant in Cleveland, the manufacturing, engineering and sales departments of the Indiana Motors Corp., Marion, Ind., a Studebaker division, is also to go to Cleveland.

Big Concentration at White

This will result in probably the greatest concentration of truck production in the country. The White line consists of chassis from one to ten tons, and buses; the Pierce-Arrow line of heavy duty trucks from two to ten tons, and the Indiana line of truck chassis from one and one half to four tons, and buses. Studebaker trucks will continue to be built at South Bend, Ind., and Rockne commercial cars at Detroit.

The International Harvester Co., Chicago, is bringing out a light delivery truck, for milk or other routes where frequent stops are necessary—a truck that might be considered competitive of the axleless rear-engine one previously mentioned.

It is not known that any manufacturer has gone farther than general plans, but the efforts to legalize beer are being closely watched for the truck business that probably would ensue. The chief interest to the truck industry is whether beer comes back in bottles or in kegs.

If in bottles the light delivery trucks which are now being put out by many passenger car manufacturers would fit into the picture, or the medium-weight trucks now used by soft drink distributors could be adapted. If kegs return to favor, a heavy duty truck with a special rack body would appear to be favored.

Still under the spur of building cars for the January shows and for dealers, the automobile industry continues to bowl along at a monthly rate approximating the 111,141 units of last July. As noted last week, a few manufacturers who started unusually early on 1933 models have tapered off, notably Plymouth, which is now down to 600 units a day.

Ford's commitment for sheets for bodies, to be made by Briggs and Murray, for the new models indicates a run of slightly under 50,000: Some parts are in production at the Rouge plant; other parts are flowing in from the outside. It appears a certainty that the present V-8 will be offered in a larger, longer, improved chassis, but it still is a guess what will be offered in the extremely low-price field, say under $400.

These releases for sheets have stimulated this department of the steel industry relatively greater than other divisions also supplying steel to the automobile industry. The local steelworks continues to operate five out of six open -hearth steel furnaces, partially on Ford business. For the separate Ford display in New York at the time the national automobile show opens, Jan. 7, only hand-made cars will be available.

Will Sell Through Terminals

Continental Motors, now conceding it will build a four as well as two sixes, one of the latter to supersede the present DeVaux, will market this low-price job through independent garages or dealers, called "terminals."

Aluminum manufacturers count it a victory to have put their material into cylinder heads on some new 1933 models. The head on the new Hudson super-six will be aluminum

for the combustion chamber, while mounted above this, with a gasket between, will be the cast iron water jacket. Graham is using a one-piece aluminum head for its sixes and eights. Ford is understood to have definitely decided on an aluminum head for the larger eight.

New Willys Is Radical

Most radically streamlined of any of the 1933 models thus far known is the new Willys series 77, a four, and the series 99, a six. In addition to the fender valances and snowplow front which many other manufacturers have adopted, the center line of the hood is a level bright strip from cowl to radiator cap, but the upper sides of the hood slope distinctly from the cowl to the radiator shell. On each side of the hood are four chromium-plated doors.

Headlights are set in the front fender, a la Pierce-Arrow, but nearer the radiator than the outer edge of the fender. The front bumper is of V design, at the center as low as the forward point of the radiator shell. Fins in the radiator shell are vertical. The rear of the body is even more radically beavertailed than the new Chevrolet, and the spare tire is recessed into the body.

The 4-cylinder engine is 3⅛ by 4¾ inches and the 6-cylinder engine 3 5/16 by 4⅛ inches. Both have floating power, under Chrysler patents. Wheels are steel spoke, with radial indentations to eliminate the resonant noise of solid disks. Bodies are all steel, the weight being 44 pounds per unit of horsepower. Freewheeling is standard equipment on the six. Both models are designated "New Era." The four will be priced under $500.

Ford Offsets Wider Sheet Use

Sheet mills benefit in tonnage from the trend toward fender valances, both front and rear, and the streamlining which brings front fenders down almost to the level of the bumper, but an offset is threatened in the effort of Ford to replace cold-rolled and autobody sheets with what is close to hot-rolled annealed.

The sheet with which Ford has been experimenting, to pare costs, is pickled following the breakdown, hot rolled for finish, given a cold pass for flattening, then box annealed. When the annealing box is withdrawn from the oven, natural gas is introduced, which during the cooling period minimizes oxidation.

Ford is understood to have developed a new kind of paint, based upon soy beans grown on his experimental farms, and is now developing a primer. Dies have been relieved to facilitate stamping these harder sheets. The sheet mill with expensive normalizing and pickling equipment stands to lose if Ford succeeds.

Tax To Offset Falling Exchange Is Proposed; Business News of Washington

WASHINGTON—To provide employment for American labor, encourage industry and agriculture and prevent loss of revenue to the treasury by supporting the dollar in its battle with depreciated foreign currencies, a bill by Representative Samuel B. Hill, Democrat, of Washington, would place a tax on imports.

This tax would apply to countries off the gold standard and would be equal to the difference between the value of the dollar and the value of the depreciated currency of the exporting country on the date the shipment is made.

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J. Carson Adkerson, president, American Manganese Producers association, points out that no manganese ore has been coming into the United States since the treasury issued its order of "suspected dumping."

There is now enough manganese ore in stock in the United States for two years, according to Mr. Adkerson, but several American mines have been reopened.

Manganese will figure in hearings before the house ways and means committee, beginning Dec. 28, in connection with the Collier bill.

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Interstate commerce commission Dec. 28 will hold a hearing on the proposal of the railroads to continue the present surcharges on freight rates after March 31. The commission will consider whether the surcharges should be continued by the filing of short-notice tariffs and whether the present pool distribution of the accruing revenue shall be terminated.

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The cartel sought by French producers of phosphorus pig iron is still in the future, according to a report to the department of commerce.

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Reconstruction Finance Corp. has agreed to purchase $2,327,000 worth of Chicago waterworks certificates of indebtedness to be used for replacing three obsolete pumping stations and laying additional mains, requiring about 5000 tons of cast iron pipe.

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One of the few confirmations of presidential appointments at this session is that of Roy D. Chapin, of the Hudson Motor Car Co., Detroit, as secretary of commerce. He succeeded R. P. Lamont when the latter became president of the American Iron and Steel institute in August.

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The President has approved the report of the tariff commission in respect to precision drawing instruments, which recommended that the present duty of 45 per cent be left unchanged. Imports of all grades of drawing instruments totaled $100,003 in the first nine months of 1932, compared with $220,620 in 1931. Germany is the principal source.

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The interstate commerce commission has found that charges collected on corrugated steel riveted pipe, in carloads, from Ashland, Ky., fabricated in transit at Pueblo, Colo., and forwarded to Austin, Nev., were inapplicable and the applicable charges were found not unreasonable. Reparation was awarded. The decision was in the case of the Colorado Culvert & Flume Co. against the Nevada Central railroad.

Sheet Sales, Output Reduced in November

Daily average sheet sales, production and shipments were lower in November than in October, according to the current report from the National Association of Flat Rolled Steel Manufacturers, Cleveland. Sales averaged 2209 net tons, compared with 3053 tons in October; output, 3023 tons, compared with 3484 tons; and shipments, 2566 tons, compared with 2981 tons. November sales totaled 66,274 tons; production, 90,679 tons; and shipments, 2566 tons.

Unfilled tonnage as of Dec. 1 was 77,339 tons; Nov. 1, 90,707. Total sheet capacity in the United States for November was approximately 550,000 tons; and the capacity on which the association's figures are based was 342,000 tons.

Canada Off in Galvanized

Production of galvanized sheets in Canada in the first nine months of 1932 totalled 22,363 net tons, compared with 34,126 tons in the corresponding period of 1931. Imports of galvanized sheets into Canada in the nine months amounted to 9621 tons, of which 7962 tons came from Britain and 1514 from the United States. Imports of black sheets for galvanizing totaled 8265.

Obituaries » » »

JOHN U. SEBENIUS, who retired July 1, 1930, as general mining engineer for the Oliver Iron Mining Co., Duluth, a subsidiary of the United States Steel Corp., died at Rochester, Minn., Dec. 19. Born in Sweden, Sept. 10, 1862, he was a graduate of the Royal Technical institute and the School of Mines, Stockholm. Coming to the United States, he became identified with the New Jersey Geological department in 1888. The following year he became geologist and mining engineer of the Ayer Estate, Boston, and in 1890 was made assistant superintendent of Witherbee, Sherman & Co., Port Henry, N. Y.

His first contact with the Lake Superior iron ore ranges was in 1892-94, when he became consulting engineer for the Rouchleau-Ray Mining Co., Duluth. When this company's properties were sold to the Lake Superior Consolidated Iron Mines of the Rockefeller interests in 1898, his services were retained and he also was associated with the Duluth, Messabi & Northern and the Duluth & Iron Range railroads in connection with important litigation. When the Lake Superior Consolidated was absorbed by the United States Steel Corp., Mr. Sebenius was appointed superintendent of explorations and mining engineer for the Oliver Iron Mining Co., and in 1906 was made general mining engineer. He was a member of the American Iron and Steel institute, the American Institute of Mining and Metallurgical Engineers and the American Society of Swedish Engineers.

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Clarence F. Fay, 45, president, treasurer and director of Abeel Bros. Inc., New York, died at his home in White Plains, N. Y., Dec. 18.

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Andrew Thompson, 55, vice president and general manager, Titanium Alloy Mfg. Co., Niagara Falls, N. Y., died Dec. 15 at Buffalo.

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C. H. Hoppe, 53, president of the C. H. Hoppe Foundry Co., Chicago, died in that city Dec. 15. He established the company in 1926.

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Louis Michel, 69, who retired in 1929 after nearly half a century of operation of a scrap metal business in Buffalo, died Dec. 15.

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Fred W. Rogers, 64, president of the Malleable Iron Range Co., Beaver Dam, Wis., died Dec. 19. He became associated with the stove foundry in 1902 and built up the business to a plant covering 14 acres of floor space. In 1921 he became president. Mr. Rogers was one of the founders and a past president of the Wisconsin Manufacturers' association.

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Earl Bevis, 55, president of the Shartel & Bevis Machine Co., manufacturer of paper mill machinery, Franklin, O., died at a Middletown, O., hospital Dec. 2.

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William E. Bock, noted for inventions in connection with tapered roller bearings and bottlemaking machinery, died early in December at his home in Toledo, O.

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Harry Hopkins, employed by Jones & Laughlin Steel Corp., Pittsburgh, for over 40 years and at the time of his death foreman of the Hazelwood polishing mill of the company died Dec. 17 at Pittsburgh.

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P. M. Smith, for the last seven years Pittsburgh district sales manager of the Treadwell Engineering Co., with offices in Farmers Bank building, Pittsburgh, Pa., died Dec. 10 at his home at Mt. Lebanon, Pa.

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George M. Bard, 80, formerly associated with the Bourne-Fuller Co., Cleveland, and the Indiana Iron Co., Muncie, Ind., and in recent years chairman of the Barco Mfg. Co., Chicago, died Dec. 21 at Chicago. He was one of the early users of natural gas in the steel industry.

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Henry J. Campbell, head of the Centennial Bell Foundry Co., Milwaukee, died Dec. 12, aged 74 years. The foundry was established by his father, Gardiner Campbell, in 1860. The son entered the business in 1877. The concern specialized in casting church bells.

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Carl G. Nebel, president of Oshkosh Auto Parts Inc., Oshkosh, Wis., manufacturing automobile replacement parts, died at Detroit, Dec. 13, from an attack of pneumonia suffered while attending the convention of the National Standard Parts association.

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Harold V. Hamilton, 51, general manager of the Burlington Steel Co., Hamilton, Ont., died Dec. 19. He was originally connected with the Hamilton blast furnace, remaining with that interest until it was absorbed by the Steel Co. of Canada in 1913. He then became sales manager of the Burlington company, and in 1918 was appointed general manager.

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Arthur B. Johnson, formerly identified with the engineering department of the Pressed Steel Car Co., Pittsburgh, and later special engineer to the executive offices of the Pittsburgh division of the Standard Steel Car Co., died at his winter home in Miami, Fla., Dec. 18. Shortly before his retirement several years

(*Please turn to Page* 40)

Here and There In Industry

W. O. LARSON FOUNDRY CO., will begin operation Jan. 1 in a large foundry at Grafton, O., recently bought from the Osborn Mfg. Co., Cleveland. W. O. Larson, foundry manager for the Hill Clutch & Machine Co., Cleveland, is president, R. N. Montis vice president, and W. A. Dennison secretary-treasurer. The foundry will produce a general line of jobbing work.

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Koehring Co., Milwaukee, has been granted a license to manufacture Meehanite castings exclusively in that territory. The foundry is equipped to turn out castings from one pound to ten tons.

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Detroit Seamless Steel Tubes Co., Detroit, C. M. Hobbs president, has moved its district sales office at Chicago to 1768 First National Bank building. L. R. Phillips is district sales manager.

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Sutton Engineering Co., Park building, Pittsburgh, has been appointed exclusive sales representative in the Pittsburgh district for Stahl Gear & Machine Co., Cleveland and Bay City Forge Co., Erie, Pa.

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Hardie-Tynes Mfg. Co., Birmingham, Ala., has designed and built four large helium gas compressors which have been shipped to the United States navy dirigible base at Sunnyvale, Calif. The compressors are duplicates of those built last year by this company and installed at Lakehurst, N. J. They have capacity of 15,000 cubic feet of helium per hour, compressing through four stages to 2500 pounds per square inch. Each compressor is operated by a 200-horsepower General Electric motor with V-belt drive.

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West Slope Construction Co., low bidder on construction of dam No. 1 in the San Gabriel canyon, recently was incorporated and is a merger of Bates & Rogers, Chicago; Foley Bros., St. Paul and New York, and Lawler & Maguire, Butte, Mont. Headquarters of the company are at Chicago. Officers are: President,

(*Please turn to Page* 50)

EDITORIAL

When Management Shows Its Record to Bankers!

RECENTLY a manufacturer startled a group of competitors by declaring in an open meeting that a seller has a right to sell his product at as low a price as he chooses—even to sell a $100 article for $1—providing he is willing to take the consequences of his act.

This bombshell started a lively argument. The consensus of opinion was that one's duty to society denies him the right to undersell at ruinous prices. Even though he may be willing to commit business suicide, he should realize that his price policy affects others. No business man, it was argued, has a right to jeopardize an entire industry by destructive price tactics any more than he has a right to burn, blow up or otherwise destroy the plants of his competitors.

The debate did not continue to a decision; both sides were right in their arguments. The majority, viewing the question from the standpoint of the culprit's moral or ethical rights, were on sound ground. Likewise, the instigator of the argument, viewing the problem from the angle of legal rights, was correct. There is nothing in the law to prevent a company from selling an article at a ruinous price, or from giving it away, if it cares to do so. In fact, some of our laws make it practically impossible for a company to protect itself against destructive price policies of others.

Business Is Powerless To Combat Menace of Unethical Practices

Most industrial executives believe in adhering to accepted ethical standards, but unfortunately there are a few individuals in every branch of industry who recognize no code except that of their own selfish interest. Blind to the appeal of fair play or of reason and immune to legal action, they continue to spread disaster among innocent victims. Thus far, the constructive element in each industry has found no way of combating this menace effectively.

Fortunately, however, there are indications that a day of reckoning is not far off. Certain developments arising out of the depression point to a situation that may succeed in forcing price chiselers to listen to reason. Strange as it may seem, the corrective weapon may appear in the hands of the bankers!

Today many companies are trying to stay away from their banks. Management is putting off borrowing as long as it can. Operations have been carried on by virtue of cash accumulated in the past, of inventories or accounts receivable, or of the liberality of creditors. In thousands of cases, companies are approaching the point where cash or credit from these sources is practically exhausted. In 1933 many of these concerns will be looking for financial assistance, which means they will be obliged to ask their banks for accommodations.

Bankers undoubtedly will employ a different technic in considering these requests than they have in recent years. In the first place, comparatively few industrial applicants for loans will be able to present balance sheets or operating statements that would justify extensive credit. Bankers will be obliged to find something beyond the traditional statements by which to determine the risk.

Bankers May Scan Operating Policies Instead of Balance Sheets

Finding the usual yardsticks futile, bank credit men probably will scrutinize the record of management. This avenue of investigation will not prove mysterious to bankers, because practically all of them have participated in industrial management extensively during the past three years. Moreover, this experience has made them familiar with the tactics of industrial pirates. Not a few bank presidents have witnessed at first hand the demoralizing effect of non-ethical price tactics upon the businesses of esteemed bank customers.

Therefore the industrial company applying for bank credit in 1933 probably will have to disclose its sales policy. If investigation shows that the applicant has been selling at a loss—which is prima facie evidence that he has been giving away his assets to his customers— the banker will question seriously the advisability of accommodating a concern whose management is so careless of its resources. If knowledge of the applicant's destructive policies has come to the bank through complaints from injured competitors, then negotiations for credit will be made even more difficult.

As between lending money to industrial raiders to permit them to continue to exchange cash for orders and extending accommodation to well managed companies for promoting profitable business, bankers will find it easy to decide in favor of the latter. Thus the sound logic of good banking may succeed in curbing a racket that has defied all appeals on ethical grounds.

THE INDUSTRIAL DIAL

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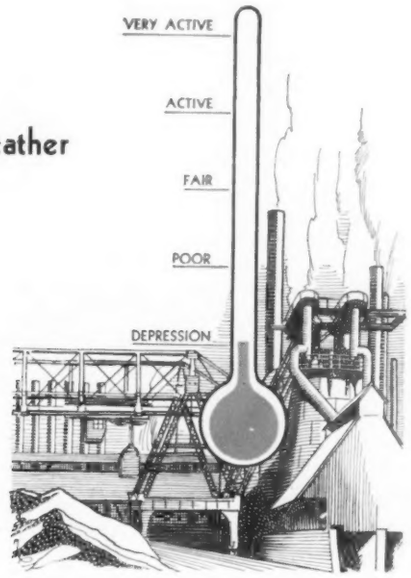
BUSINESS is staging a determined defensive against the usual year-end recessions. All along the line appear evidences of a stamina that was not apparent at this time in the closing month of 1931. If the resistance now manifest keeps up through the brief remaining period of December, business will enter the new year with at least a remnant of the gains won last fall.

Activity in the automobile industry has helped to soften the effect of slackening in other branches of industry. Production of cars in the second week of December leaped sharply. Car loadings and electric power output—general indicators of industrial activity—are tapering off gradually. Steel operations have lost ground, but even here the retreat is hard fought.

Industrial Weather



TREND:

Resisting Seasonal Pressure

Building Permits Stage Surprise

Among the mildly favorable indications of recent weeks are the continued diminution of commercial failures, an unexpected rise of more than 10 per cent in building permits in November, continued increases in the liquidity of banks, sustained vigor in the production of bituminous coal, a slight and perhaps belated swelling of new machine tool orders, and a stubborn resistance to downward pressure on the part of commodity prices.

The marketing branch of the petroleum industry presents an unusual situation, compared with that of other lines of business. Domestic demand for gasoline has increased in every month since July. In November the total was practically on a par with that of November last year. Gasoline stocks have been kept in hand; consequently the prospect for the next few months is rather promising.

After three months of improvement, foreign trade of the United States suffered a relapse in November. Exports for 11 months of 1932 totaled $1,481,370,000, a drop of 33 per cent from last year. Imports for the 11 months this year were $1,225,000,000, down nearly 37 per cent from the total for the corresponding months of 1931.

Decision on Rails Held Back

Railroads are backward in placing commitments for rails. With the wage question in the foreground, the delay in regard to rail orders may have the effect of withholding from the steel industry some business which usually is counted upon as a backlog for January and February. *Railway Age* estimates that need for the expenditure of $500,000,000 by railroads for rehabilitation, improvements and belated maintenance exists.

Where Business Stands

Monthly Average, 1931 = 100

	Nov., 1932	Oct., 1932	Nov, 1931
Steel Ingot Output	48.7	51.3	79.5
Pig Iron Output	41.7	41.6	73.4
Freight Movement	76.6	88.2	91.3
Building Construction	39.9	36.2	67.3
Automobile Output	29.7	24.4	34.0
Wholesale Prices	79.6	83.1	92.2

Business Trend Charts of the Month

Production

Steel operations ..... Dec. 12, p. 19
Blast furnace production rate ..... Dec. 12, p. 20
Steel ingot production ..... Dec. 19, p. 20
Pig iron production ..... Dec. 12, p. 20
Industrial production ..... Dec. 5, p. 20

Demand

Unfilled orders, U. S. Steel Corp. ..... Dec. 26, p. 17
Railroad car orders ..... Dec. 19, p. 20
Index of machine tool orders Nov. 7, p. 20; Dec. 26, p. 18
Building construction ..... Dec. 12, p. 20; Dec. 26, p. 18
Automobile production ..... Dec. 5, p. 19

Prices

Bradstreet's index of commodity prices ..... Dec. 19, p. 19

Miscellaneous

Commercial failures ..... Dec. 19, p. 20
Iron and steel imports and exports ..... Dec. 5, p. 20
Monthly railroad earnings ..... Dec. 26, p. 17
Foreign trade ..... Dec. 5, p. 20

Thumb Nail Sketches Of Business

A brief summary of the agricultural situation is presented by the bureau of agricultural economics, department of agriculture, as follows: Prices of farm products stand this fall at an index of 54 (prewar average being considered as 100), prices paid by farmers for commodities bought 106, farm taxes about 250, farm wages 84. The general wholesale price level of all commodities stands at 94. Industrial wage rates are around 175.

Railroads' Non-productive Expense Rises

Non-productive expenditures of the railroads are increasing due to legal obligations, regulatory requirements or the pressure of public opinion. A survey completed by the American Railway association shows that expenditures for separation or elimination of grade crossings, track elevations, grading and paving and other public improvements in the five-year period from 1927 to 1931, inclusive, totaled $436,738,000. Of this amount, $198,388,000 was charged to capital and $238,400,000 to operating expenses. These expenditures do not produce added revenue nor do they reduce operating costs.

Orders for Machine Tools Fluctuate Slightly

Machine tool orders have pursued a course in 1932 somewhat independent of the general trend of industrial production. This is in sharp contrast with their behavior in 1931, when they followed the trend line faithfully. During the short-lived spurt of business in the spring of 1931, the index of machine tool orders soared from 65.3 in January to 103.3 in May. But in the fall of 1932, when business registered gains in August, September and October, the index of machine tool orders dropped to 27.7 in September and rebounded to only 28.4 in October and 29.6 in November. However, the resistance shown in the second and third quarters and the belated though slight rise of the fourth quarter represent the most impressive showing since early 1931.

Diplomatic Staff Helps Trade

According to an estimate by the state department United States consular officers throughout the world in the year ended June 30 last were instrumental in helping American exporters to secure new business or to effect savings aggregating $15,000,000, as compared with $19,000,000 in the preceding year.

Freight Traffic 25 Per Cent Behind 1931

Revenue freight volume up to and including the week ended Dec. 3, 1932, totaled 26,255,457 cars compared with 35,012,832 in the same period in 1931. This indicates a loss of 25 per cent, which will be the approximate margin by which the full year of 1932 will fall below the total for 1931.

Bituminous Coal Output Gains Again

According to the weekly report of the bureau of mines, soft coal output in the week ended Dec. 10 totaled 6,775,000 tons, compared with 6,750,000 tons in the previous week and 7,290,000 tons in the corresponding week of 1931. In November bituminous coal output exceeded that of 1931 in two weeks. It is one of the few commodities in which the 1932 trend line has crossed the path of 1931 production.

The Barometer of Business

Industrial Indicators

	Nov., 1932	Oct., 1932	Nov., 1931
Pig iron output (Daily average, tons)	20,855	20,795	36,727
Machine Tool Index	29.6	28.4	50.4
Unfilled orders (tons)	1,968,301	1,977,040	2,933,891
Ingot output (Daily average, tons)	39,031	41,098	63,666
Dodge Bldg., awards in 37 states (sq. ft.)	12,068,100	11,033,700	20,519,300
*Automobile output	61,216	51,857	70,114
Coal output, tons	30,634,000	32,677,000	30,110,000
Business failures; number	2,073	2,273	2,195
Business failures; liabilities	$53,621,127	$52,869,974	$60,659,612
Cement production, Bbls.	.....	7,939,000	8,161,000
Cotton consumption, bales	503,722	502,244	425,228
Car loadings (weekly average	548,802	631,620	654,926

*Estimated.

Foreign Trade

Exports	$139,000,000	$153,000,000	$193,540,000
Imports	$104,000,000	$106,000,000	$149,480,000
Gold exports	.....	$57,000	$4,994,000
Gold imports	.....	$20,674	$94,430,000

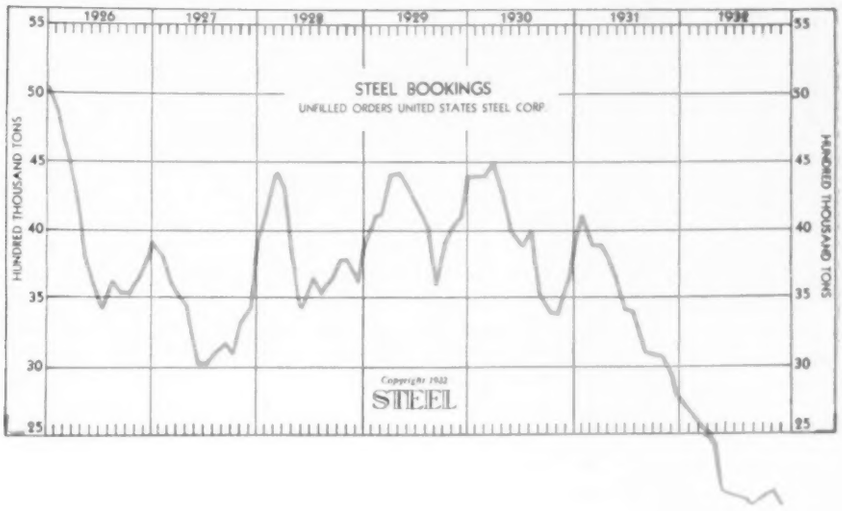
Financial Indicators

	Nov., 1932	Oct., 1932	Nov., 1931
25 Industrial stocks	$90.39	$90.29	$148.43
25 Rail stocks	$22.06	$22.49	$41.22
40 Bonds	$65.51	$66.57	$72.22
Bank clearings (000 omitted)	$17,828,196	$19,785,373	$23,791,621
Commercial paper rate N. Y., per cent	2	2	4
*Commercial loans (000 omitted)	$10,413,000	$6,164,000	$7,574,000
Federal Reserve ratio, per cent	62.6	61.9	65
**Railroad earnings	$63,839,317	$49,646,869	$64,020,077
Stock sales, N. Y. stock exchange	23,037,683	29,187,659	37,368,728
Bond sales, par value	$159,419,300	$189,254,000	$232,514,300

*Leading member banks Federal Reserve System.
**October, September and October respectively.

Commodity Prices

	Nov., 1932	Oct., 1932	Nov., 1931	Monthly aver., 1913
STEEL's composite average of 14 iron and steel prices	$29.12	$29.32	$30.61	$26.32
Bradstreet's index	$6.97	$7.28	$8.08	$9.21
Wheat, cash (bushel)	63c	66c	75c	92c
Corn, cash (bushel)	43c	42c	55c	51c
Petroleum, crude (Bbl.)	90c	90c	75c	$2.50



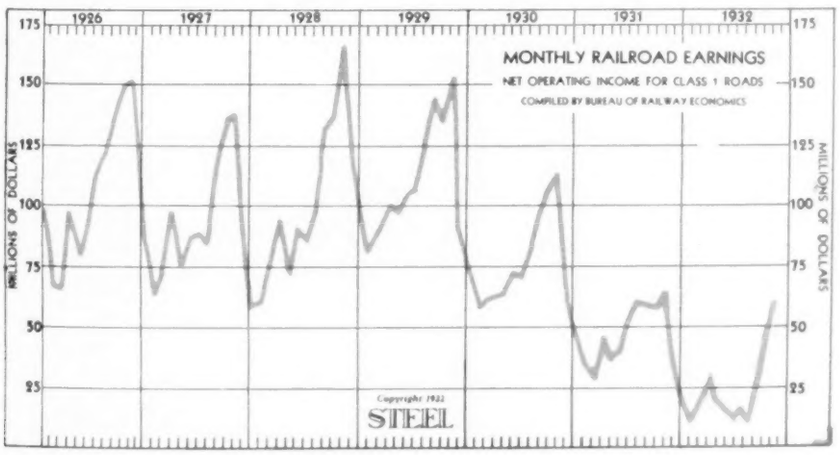
Nov., 1932	1,968,301
Oct., 1932	1,977,040
Nov., 1931	2,933,891

Backlog of Steel Bookings Declines in November

The backlog of unfilled orders of the United States Steel Corp. dropped 28,739 tons in November and at the end of the month totaled 1,968,301 tons. This decline of 1.45 per cent cancelled the brief upward movement made during August, September and October. Unfilled tonnage on November 30, 1931 totaled 2,933,891 tons compared to 3,639,636 tons during the same period in 1930 and 4,125,345 tons in November, 1929. On March 31, 1931, unfilled orders stood at 3,995,330 tons, this was followed by a downward sweep of 16 consecutive months to finally reach a new all time low in July with a total of 1,966,302 tons.

Railroad Earnings Gain in October; 1.88 per cent on Investment

Earnings of Class 1 railroads in October continue to show a gradual improvement from the depressing lows experienced during the early part of the year. Net operating income for October at $63,839,317 was the highest reached this year and was at the annual rate of return of 1.88 per cent on property investment. In October last year net income was slightly higher at $64,202,245. Class 1 roads for the first 10 months of 1932 had a net income of $2,266,295,438 which at the rate of return of 1.16 per cent. From a total of 167 class 1 railroads, 61 roads failed to earn expenses and taxes in the first 10 months of 1932.



Oct., 1932	$63,839,317
Sept., 1932	49,646,869
Oct., 1931	64,020,077

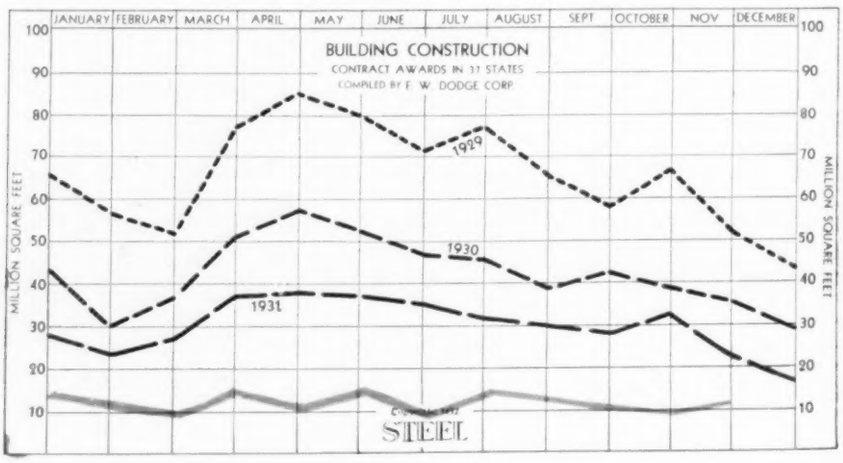
	Per Cent
November, 1932	29.6
October, 1932	28.4
November, 1931	50.4

Machine Tool Orders Up Slightly; Shipments Show Weakness

The three-month moving average of machine tool orders increased for the second month in November according to the report issued by the National Machine Tool Builders association. The three-month index for November stood at 29.6 compared with 28.4 for the preceding month and 50.4 for November, 1931. The shipment index declined to almost the mid-summer rate, the index for the month being 28.9 compared with 45.4 for the preceding month and 49.9 for November last year. The index of unfilled orders increased to 42.2 from 41 in October and compares with 97.2 for November last year. The rise in November indicates a little more strength in the demand for tools.

November Building Awards Gain As Valuations Decline

Building activity in 37 eastern states, as measured in new floor space, gained over 1,000,000 square feet during November. For the month of November total construction aggregated 12,068,100 square feet compared with 11,033,700 in October and 20,519,300 square feet during November last year. The valuation of contracts awarded during the current month was but $45,893,600 less than in November, 1931, the valuation for November this year being $105,302,300 against $151,195,900 in the same month last year. According to reports of F. W. Dodge Corp., total construction for the first 11 months of 1932 involved 71,924 projects for a total of 148,626,700 square feet.



	Square Feet
Nov., 1932	12,068,100
Oct., 1932	11,033,700
Nov., 1931	20,519,300

DESIGNING STEEL CASTINGS FOR ECONOMY IN MANUFACTURE

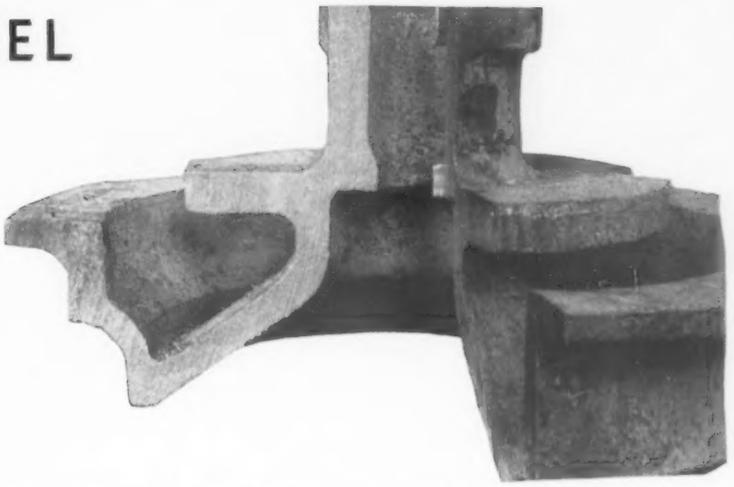


Fig. 1—This cut-away cylinder head casting illustrates desirable uniformity of section and gradual direction change of various members. Its design simplified foundry problems

Part II

By F. A. LORENZ J.
American Steel Foundries

DEEP pockets which have sharp interior corners, or which are produced by bodies of sand of insufficient area to conduct the heat of the surrounding metal properly, are to be avoided in designing steel castings. Such pockets produce the difficulties of sharp corners and also present the disadvantages of difficult removal of sand. If pockets cannot be avoided, as many and as large openings as possible should be made to permit heat transfer and to facilitate removal of sand.

Junctions of bosses or trunnions with other sections of the casting frequently are sources of difficulty. Bosses often are of greater cross-section than members to which they are joined. This inequality gives rise to a serious concentration of heat at the junction. Provisions should be made in such instances for as near an approach to equalization of sections as possible. This may be accomplished by the use of adequate fillets, and by coring out the boss so that its section is comparable to that of the member to which it is joined. This equalization of section not only assists in production of sound castings, but does much to avoid concentration of stresses imposed in service, wherever section changes are abrupt.

Fig. 2—Sweeping curves are used in this casting to avoid radical changes in direction. Load distribution is improved and at the same time the casting is produced more easily

Abrupt changes in cross section invariably are to be avoided. Expenditure of time to devise ways of avoiding them is repaid amply in improved ability of the casting to meet conditions of service to which it is put. Joining a light section to a heavy section, even though adequate fillets are provided, imposes severe stresses at the point of union, both in the cooling of the casting and under load in service. Such a condition often may be relieved by a proportional thickening and thinning of the two sections to bring them at least to practical equality. This produces a far stronger unit because of the material reduction in stress concentration. Often it is found that by an equalization of sections throughout the design, weight can be saved and strength can be increased greatly.

The results obtained by Kommers and Moore in rotating-beam tests upon bars 0.40-inch in diameter show the drastic effect of the concentration of stresses in abrupt changes in cross section. In each bar the section was reduced to 0.275-inch in diameter at its center. In the bar in which this diameter was reached by a 9.85-inch radius, the endurance limit was 49,000 pounds per square inch. By using a ¼-inch radius, this value was reduced 8 per cent. With a square shoulder, it was reduced 51 per cent, and with a V-notch, 60 per cent.

Computation of

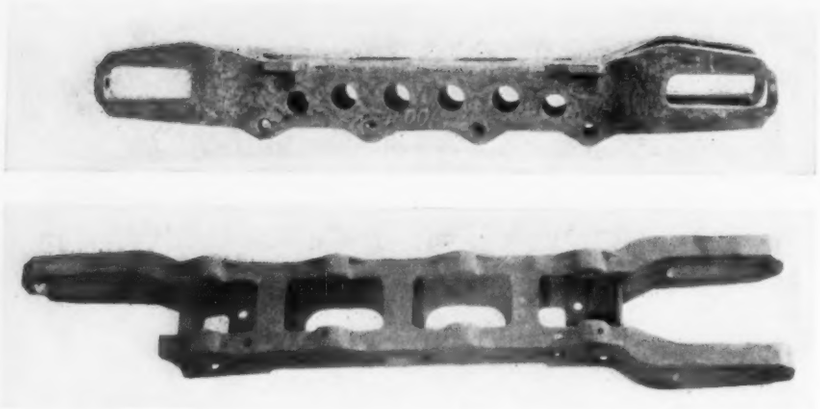


Fig. 3—Two views of original design of steel casting which involved the use of complicated cores in molding

fiber stress at points of unmodified changes of section is difficult if not impossible because of inability to determine the influence the change exerts in concentrating load stresses. That the influence is great and that such conditions zealously should be avoided whenever possible, is obvious. Fig 2 shows an excellent example of the use of sweeping curves to avoid radical changes in direction. The flange at *A* swells gradually to accommodate the change from ½-inch to the ⅞-inch metal of the column head, which, in the broad curves of *B* and *C*, forms the union with the upper flange of the extension. Such features not only are desirable from the standpoint of load distribution, but lend themselves admirably to the satisfactory production of the casting.

Fig. 1, showing a cut-away section of a cylinder head casting, is an example of desirable unformity of section and gradual direction changes of various members. Not only is the casting designed to produce an equalized distribution of load, but a simplification of foundry problems is accomplished.

Details Impede Contraction

Linear shrinkage of steel, as it cools from the liquid state, involves an actual movement of the casting through the sand. In the case of a perfectly flat piece with no projections such as flanges, bosses, or brackets, normal unimpeded contraction will take place. Presence of such details reduces the measurable contraction because they prevent unrestricted movement. It is not always possible to predetermine the exact extent of this influence on contraction when the pattern is being made, and at times this causes a delay in producing a casting dimensionally correct.

Shrinkage or contraction concerns the designer largely because of its influence on the cost of castings. The foundryman must take into consideration the expense entailed by precautionary steps in producing a casting free from cracks and cavities caused by shrinkage or contraction. Many safeguards of practice are applied successfully for this purpose in addition to normal production methods, but they necessitate extra manufacturing expense. The designer, either through his general knowledge of the behavior of the metal in cooling, or through information obtainable from the foundryman, can assist greatly in obtaining a satisfactory casting at a reasonable cost.

Simple Cores Advisable

The two views of the casting shown in Fig. 3 show the original design of the piece, the molding of which involved the use of complicated interior cores. These cores necessitated not only elaborate and expensive core box equipment but required special attention in their production. They required a special sand mixture and extreme care in setting the cores in position to avoid cracks which were prone to appear as the metal contracted over the cores. These precautions added to the cost of production and retarded progress of castings through the shop.

The redesigned casting, shown in two views in Fig. 4, eliminated the use of interior cores, and permitted the pattern to leave its own core when withdrawn from the sand. Cores were required to produce the brackets and ribs on the exterior, but the equipment was simple and the cores were produced at a much lower cost than the interior cores of the other design. The difficulties from cracks were eliminated, for the contour of the new design lent itself to self-adjustment in cooling, and in general proved a decided improvement over the old construction.

Intricate Designs Costly

It may be said that the weight of a casting does not in direct proportion affect its cost of production. The greatest single influence in this respect is the degree of intricacy of design. Two castings of the same weight may be at the extremes of high and low production costs. The simplicity of one may assure its rapid progress through manufacturing operations, while the other, due to complicated design, may require special effort at every stage of its production. A premium in selling price must be exacted for this additional cost.

Where equalization is not possible, junctions of unequal members should be as gradual as possible and be accomplished by fillets, tapers or curves. These devices avoid the detrimental concentration of stresses which are not only pernicious in their effect upon the strength of the casting in service, but increase the difficulties of production. The expenditure of time in modifying a de-

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TO produce steel castings economically requires a knowledge of the characteristics and behavior of the steel in molds and practical application of this information in the conception of castings. This can be brought about only through continued co-operation between the designer and foundryman. In Part I of this article, appearing in the Dec. 12 issue of STEEL, the author devoted attention to design for uniform cooling, particularly as to chilling effect and feeding. In this, the concluding installment, he continues by discussing abrupt changes in cross section, elimination or reduction of cores and proper pattern equipment. These two articles are from a paper presented at the symposium on steel castings before the joint meeting of the American Foundrymen's association and the American Society for Testing Materials in Atlantic City, N. J., in June. The author, F. A. Lorenz Jr., is general manager, industrial division, American Steel Foundries, Chicago.

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sign to eliminate or reduce to a minimum the number of cores required usually will be repaid in an appreciable reduction in the cost of the casting.

The staggering of sections as shown in Fig. 3 (STEEL, Dec. 12, page 22) and the relief of heavy junctions as shown in Figs. 1 and 2 (STEEL, Dec. 12, page 21), are helpful devices in securing uniformity in cooling rate and in avoiding use of excessive feed metal. Observance of these precautions will do much to reduce the cost of the casting and insure its integrity.

Patterns Are Important

Pattern equipment plays an important part in determining the cost of castings. Whether or not the foundryman is to be intrusted with the manufacture of the pattern, his suggestions as to its construction should be given much consideration. His judgment as to the expense which may be incurred properly is based upon an appreciation of the length of time a pattern may be expected to produce castings of dimensional accuracy.

Frequently quotations for pattern equipment made by commercial pattern manufacturers are based upon the production of the equipment, and not upon its greatest utility in the production of castings. This is likely to prove costly when bids for castings from it are received, and it is possible that the engineer's efforts to produce a satisfactory steel casting design may be defeated.

There are many variations in pattern construction of which the patternmaker may take advantage. Some of these, while lowering pattern costs, impose unnecessary expense in producing the casting. Sections may be attached as loose pieces which would more properly be made by use of a core. A core may be used where the results would be far more satisfactory if more extensive pattern work permitted the section to form its own core. Construction of pattern equipment should always be given serious consideration and be planned as the result of experience and keen observation. It is not enough that a casting can be produced from a pattern. It must be constructed with proper regard for its maximum utility.

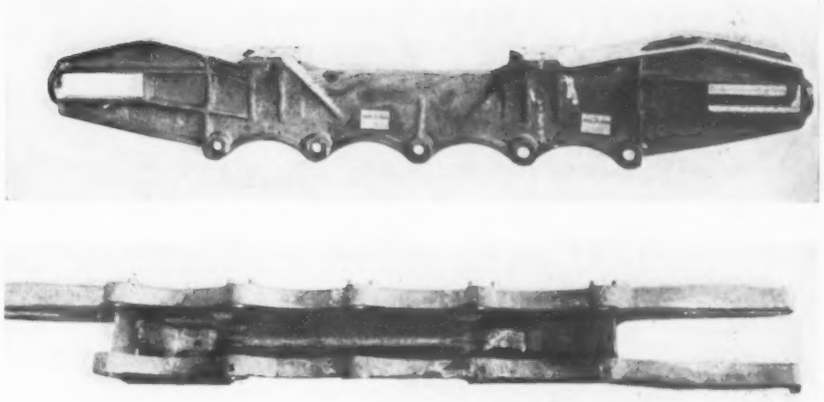

Fig. 4—The redesign of the casting shown in Fig. 3 which permits the pattern to leave its own core when withdrawn

Beer Rumblings Awaken Interest in Chrome-Nickel Steel for Breweries

PROSPECTS for the early return of beer in the United States have revealed activities in steel production and fabrication, regarded by leaders as of utmost significance in the metal industries, particularly with regard to production and fabrication of chrome-nickel steel.

While there has been a marked revival of interest in the companies manufacturing glass bottles, seals, caps and other equipment, little has been noted of the part steel will play in the restored industry. Nevertheless, actual production of beer equipment in new stainless steel material has already begun by fabricators, including a newly designed beer keg of chrome-nickel steel.

The importance to the steel industry of these developments is indicated by inquiries reaching offices of the Union Carbide & Carbon Corp., New York, following a canvass of the situation in both the steel and brewing industries. One steel company official expressed the belief that "the return of beer offers more possibilities for the stainless steel industry than any other one factor now in prospect."

Wide Usage Visioned

"When the return of beer appeared imminent," recently stated W. J. Priestley, vice president, Electro Metallurgical Co., a unit of the Union Carbide & Carbon Corp., "a large percentage of the 1200 breweries which were in business in 1917 displayed a keen interest in the use of stainless steel for their equipment.

"With the information supplied them, brewers are now talking about the shipment of beer in large tank cars and its further transportation by trucks and cylinders made of chrome-nickel steel. Vats and storage tanks in breweries, coils, syphons, measuring vessels and fittings may all be made of this steel, and already test machinery has been installed in breweries looking to the adoption of complete outfits.

"Of course we have the benefit of the advances made in Germany and England while the industry in our country has been more or less static; but the beer manufacturers appear to want new tests here. Facilities for this preliminary work are being furnished."

Will Relieve Wood Shortage

According to present information, there is a shortage of oak wood, of which the old-time beer barrels were made and which formed parts of other equipment. Use of steel would give productive impetus to makers of the chrome and nickel alloys, the steel producers, steel fabricators, tank car manufacturers, truck manufacturers and a number of allied industries.

"Another new feature," added Mr. Priestley, "is that with the metal containers beer may be pasteurized just as the old time bottle beer was pasteurized. The question of cold storage will thereby be solved. As to the suitability of this 18-8 chrome nickel steel for the brewery industry, we have the exhaustive tests of the British Bureau of Bio-technology. These tests showed that the character of the beer produced in the vessels was, without exception, excellent as regards flavor, brilliancy, fullness, conditioning and head retention. Furthermore, there was no action on the steel. The latter did not affect the yeast, nor disturb the attenuation, nor in any way impair the quality of the beer as judged from the absence of any adverse influence on color, flavor or stability. The steel has proved to be inert to the action of fermentation."

IMPROVING OPEN-HEARTH FURNACE DESIGN

By WILLIAM C. BUELL JR.

Part III—Roofs and Their Supports

(Thirteenth Article of Series)

THE thermal characteristics of the roofs selected for comparative analysis are given in Table XXXIII. The brick details of these roofs are as shown in Table XXXI, and the data are based on an average flame temperature of 3148 degrees Fahr., which was the value established in the discussion of bottoms as the flame temperature required to satisfy the radiation requirements of the ideal bottom. While the area of the receiving surface and the emitting surface vary on account of the difference in the lengths of their arcs still the maximum difference is not sufficient to affect the accuracy to any marked degree, particularly in view of the several assumptions required.

In arriving at the values of emission the reader will notice that these are calculated as for the roof brick only and no extra resistance is assigned on account of the ribs. In view of the exposed end surfaces of the ribs it is believed that the extra thickness of the refractory at the ribs will add little or no insulating value.

One source of savings which is intangible, but, none the less, important is the difference in the average flame temperature required to satisfy the emission rates of the various roof thicknesses. Table XXXIII shows that in roof ZA a differential of 424 degrees Fahr. between the average flame temperature and the hotter refractory surface must be maintained to satisfy the radiation requirements of 5426 B.t.u., while in the case of ZE the necessary differential is 354 degrees Fahr. for an emission of 3850 B.t.u.

Thus it will be seen that the increase in roof thickness from 12 to 18 inches decreases the flame temperature requirements about 70 degrees. Assuming the hotter surface of the roof to be the same in both cases the life of the thicker roof would be increased considerably from the diminution of the erosive effect of the furnace gases alone. The lessened requirements for flame temperature would tend to decrease the fuel rate and this would be reflected to the advantage of the entire furnace system and operation. However, these items of improvement cannot be assigned concrete values.

Certain data from various tables having reference to the detail, thermal properties and cost of selected roofs are assembled in Table XXXIV. The cost per r increases with the greater depth of the roof brick on account of the higher cost of the same material in brick of larger size which is covered by the so-called "extra list". Therefore, as the thicker roof is relatively more expensive as to first cost, economies from other sources must be found to justify its installation.

Heat Flow and Tonnage Costs

Given the first cost of a roof, its emission rate, the length of the campaign in hours, and the cost of the fuel, it becomes a simple matter to determine the cost of the heat radiating through a roof during its life. The equation for this determination follows:

$$W = \frac{A \times U \times Z \times M}{1{,}000{,}000} \quad \ldots\ldots (6)$$

in which:

W = Total cost of radiation through a roof in dollars per campaign
A = Area of the outer surface of the roof in square feet
U = The overall rate of emission through 1 square foot of roof per hour
Z = The length of the campaign in hours
M = Cost of fuel, per million B.t.u. as fired, taken at 30c.

The various roofs under discussion have been assigned in Table XXXI arbitrary lives. In order to secure a value for Z in the foregoing equation, it is necessary that the roof life be reduced to hours. Although hardly fair to the heavier roofs, the length of heat has in all cases been taken as 12 hours. Based on this value and on a 150-ton furnace the cost of radiated heat for the several roofs will be as listed in Table XXXV.

In these calculations the developed emission rate, which is a maximum for a roof of the designated thickness, is charged throughout the duration of the campaign in spite of the fact that the roof cools to some degree after each heat and probably carries the maximum temperature only for

Table XXXIII

Thermal Properties of Selected Roofs

Roof	Temperature ° Fahr. Flame	Inner surface	Coefficient r	Outer surface Temp. ° Fahr.	Emission rate	Heat flow B.t.u./sq. ft./hr.
Column	a	b	e	f	g	h
ZA.....	3148	2724	1.000	562	11.75	5426
ZB.....	3148	2745	1.125	540	11.25	4950
ZC.....	3148	2764	1.250	520	10.75	4530
ZD.....	3148	2775	1.333	503	10.50	4235
ZE.....	3148	2794	1.500	485	10.00	3850

Table XXXIV

Cost of Thermal Properties in Selected Roofs

Derivation	Table XXX			Table XXXIII			C/g
Roof	Thickness, inches Roof	Ribs	Cost per square foot	Temp. cooler surface, degree Fahr.	Emission, B.t.u./sq. ft./hr.	Resistance r	Cost r
a	b	c	d	e	f	g	h
ZA.....	12	15	$1.92	562	5426	1.0	$1.92
ZB.....	13½	16	2.15	540	4950	1.125	1.92
ZC.....	15	18	2.49	520	4530	1.25	2.00
ZD.....	16	20	2.87	503	4235	1.333	2.15
ZE.....	18	22½	3.40	485	3850	1.5	2.27

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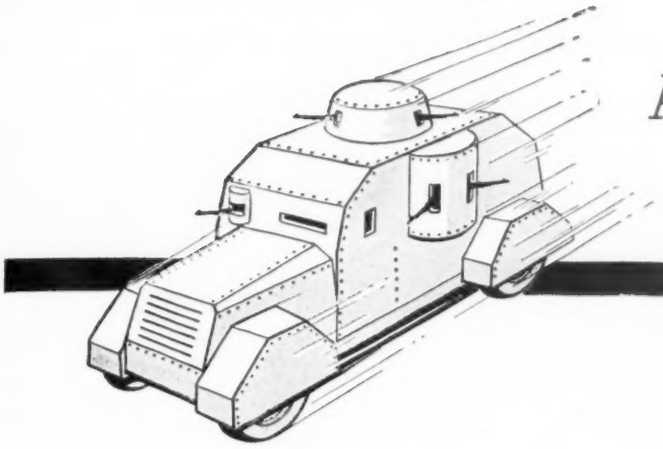

This E. M. BRIQUET was removed just before entering the melting zone and shows how the alloy is protected from oxidation during its descent through the upper oxidizing zone of the cupola.

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Table XXXV

Cost of Radiated Heat from Selected Roofs

Roof	Area in sq. ft.	Emission rate, B.t.u./sq. ft./hr	Heats per campaign	Hours per campaign	Cost of radiated heat per campaign
ZA.....	1008.5	5426	186	2232	$3995
ZB.....	1013.5	4950	212	2544	4200
ZC.....	1020.6	4530	250	3000	4575
ZD.....	1026.6	4235	291	3492	5035
ZE.....	1037.0	3850	350	4200	5575

its individual equipment which is not common to the entire plant, such as a waste-heat boiler may be estimated conservatively to cost $600,000. At 14 per cent the weekly carrying cost is thus about $1600. If the furnaces under discussion are credited with eleven heats per week each, (possibly unfair to the furnaces with the heavier roofs) and at the end of the campaign a charge of three weeks is made for rebuilding, then the gross length of the campaign, the carrying charges, tons produced in the gross campaign and the cost of the carrying charges per ton of ingots will conform to those in Table XXXVII. Data presented in this table disclose additional apparent worthwhile savings from the use of the heavier roof through the longer length of campaign.

Table XXXVI

Recapitulation of Selected Roof Costs

Roof	Depth, inches	Costs Per Campaign: Roof	Radiated heat	Total	Ingots produced, tons	Cost per ton of ingots
ZA.....	12	$2080	$3995	$6075	27,940	$0.217
ZB.....	13½	2376	4200	6576	31,880	0.210
ZC.....	15	2793	4575	7368	37,500	0.196
ZD.....	16	3256	5035	8291	43,700	0.187
ZE.....	18	3912	5575	9487	52,500	0.180

perhaps half the time of the heat, and is subject to weekend or other curtailment of operation. However, with usage the roof loses depth, the emission rate increases from the loss of thickness and it is believed that the use of the calculated emission value over the entire campaign is as equitable a figure as could be ascribed.

As the length of a furnace campaign usually is dependent on the life of the roof it appears that the cost data of Table XXXVI are sufficiently conclusive to demand the inclusion of the heaviest roof. These data cover only one group of factors of roof life that lend themselves to a reduction to concrete figures. Another group of costs that lends itself to tangible analysis, includes the purely capital costs, interest on plant, depreciation and taxes. These costs can be grouped reasonably as 14 per cent of the investment.

The first cost of a 150-ton furnace installation to include the furnace proper, its containing building bay and

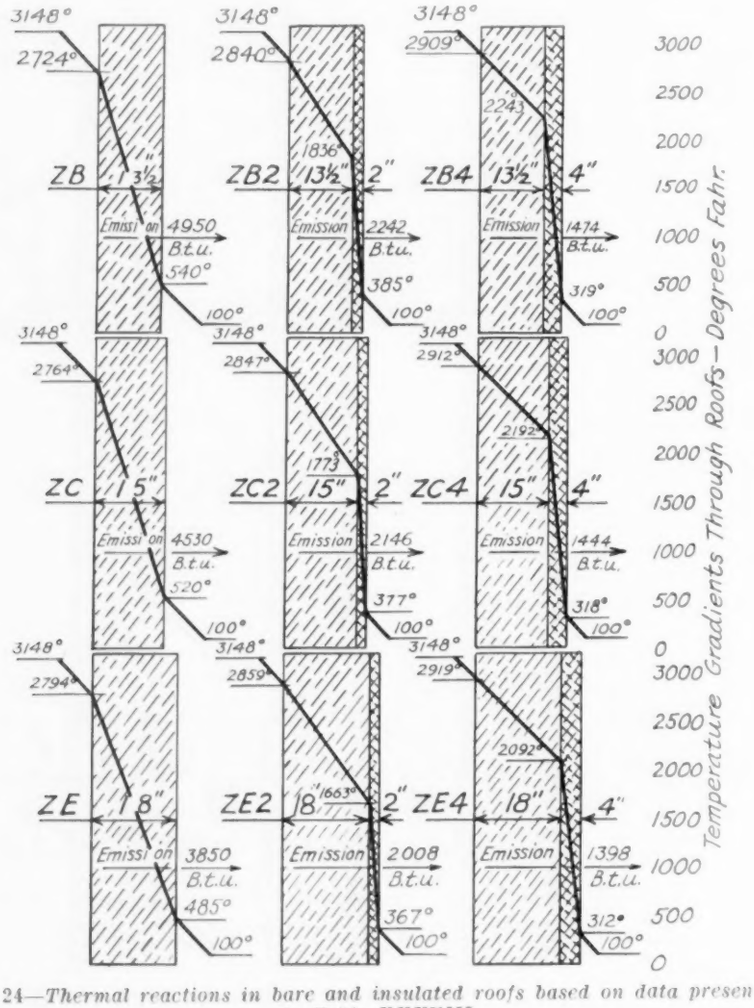


Fig. 24—Thermal reactions in bare and insulated roofs based on data presented in Table XXXVIII

Insulation of Roofs

Insulation of open-hearth furnace roofs should be accomplished to some degree. Of the various basic open-hearth furnace roofs in which insulating material is used one unit of 125 tons capacity is reported to have produced 456 heats, the radiation loss from the insulated roof being 200 degrees Fahr. less than from the non-insulated roof, that is, the outer temperature of the roof was cooler by that extent*.

Several attempts to insulate roofs, however, have not met with the success of the instance cited. Some of these failures may have been the result of over-insulating, or perhaps the lack of knowledge of the properties of the material used for insulation was the direct cause of failure.

For the purpose of demonstrating the change in temperature gradients in open-hearth furnace roofs through the use of insulation, three silica brick depths, 13½, 15 and 18-inch roofs have been selected for analysis, roofs ZB, ZC and ZE, respectively in Table XXXVIII. Temperature gradients and the heat flow through these roofs without insulation are included In this table roofs considered to be built with 2 inches of a medium grade of insulation having heat flow properties in accordance with the values

*American Institute of Mining and Metallurgical Engineers. Proceedings of twelfth semiannual conference of the Open-Hearth committee, 1930, page 22, and ibid., thirteenth semiannual conference 1931, page 20.

Table XXXVII

Capital Costs of Open-Hearth Furnace Campaign

Furnace	Length of Campaign Heats	Weeks*	Capital carrying charges	Ingots produced, tons	Capital charges per ton ingots
ZA	186	20	$32,000	27,940	$1.14
ZB	212	23	36,800	31,880	1.15
ZC	250	26	41,600	37,500	1.11
ZD	291	29	46,450	43,700	1.06
ZE	350	35	56,000	52,500	1.06

*Includes three weeks for rebuilding.

of Fig. 22, are designated ZB2, ZC2 and ZE2, respectively. Roofs having 4 inches of insulation of the same grade are designated ZB4, ZC4 and ZE4. The relations as presented in Table XXXVIII are shown graphically in Fig. 24.

Adding insulation to roofs will increase the costs listed in Table XXIX by about 38 cents per square foot for 2-inch thickness and 75 cents for 4-inch thickness, an extra expense that easily can be justified.

Temperature Is a Factor

As previously mentioned insulating materials should not be subjected to temperature in excess of 1800 degrees Fahr. In the case of the elements previously considered insulation has been required to support various loads and the advisability of subjecting loaded insulation to temperatures in excess of the figure discussed is open to question. In the case of insulating material on roofs the material is unloaded totally and under this condition it is thought slightly higher temperatures would not prove detrimental.

Any of the group of roofs with 2 inches of insulation with the thermal properties as specified, or any suitable insulation of differing properties in such thickness that its thermal reactions will be equal to that specified should greatly improve the economics of the open-hearth roof. The material reduction of flame temperature requirements, outer surface temperature and emission make the use of insulation particularly attractive from all points of view. In roof ZE the difference between the flame and the hotter surface is 354 degrees; in ZE2, 289 degrees; and in ZE4, 229 degrees Fahr. At the elevated temperatures of these operations any reduction in flame temperature requirements is of the greatest value in lengthening roof life. Even a casual examination of Table XXXVIII discloses that the use of 4 inches of insulation of the properties named creates excessive temperatures of the insulating material and it follows, therefore, that roofs designed to include 4 inches of similar insulation will be over-insulated.

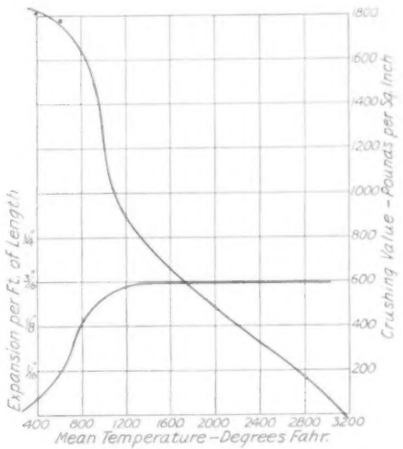


Fig. 25—Average thermal expansion and compressive strength of silica brick

A factor which must be considered carefully in using insulation on roofs is to what extent the crushing value of the silica brick will be impaired by the increased mean temperature of the silica brick when covered with insulation. In roof construction, the silica brick is under considerable compression stresses. This phase will be considered in a subsequent article. For convenience in investigating the results of varying temperature, a chart, Fig. 25, is included to show the crushing strength of an average silica brick through the open-hearth temperature range. The crushing strength, as will be noticed, recedes rapidly at elevated temperatures.

In the noninsulated roofs the mean temperature of the silica brick is about 1800 degrees Fahr. By using Fig. 25 its crushing strength will be found to be nearly 600 pounds per square inch. The mean temperature of the silica brick in the roofs with 2 inches of insulation is about 2500 degrees Fahr. and the crushing strength of the brick is about 275 pounds per square inch, or less than one-half of the previous case. The mean temperature of the silica brick in the roofs with 4 inches of insulation is about 2700 degrees Fahr. and the crushing strength about 200 pounds per square inch. As a result of over-insulation the early failure of this latter group of roofs would be expected from brick deformation.

Insulation by all means should be employed, whether in bottoms, back walls or roofs, but it must be used with care and understanding if success is to be attained.

Spalling Causes Failure

Flat or suspended roofs have been applied to open-hearth furnaces in a limited way and a measure of success has been reported in some cases. The intermittent operation from the curtailed production of the past few years has mitigated severely against its successful use. Excessive spalling is the usual cause of failure and this may be traced largely to the lack of sufficient compression within the roof itself to minimize this action.

Even casual examination of flat roof design will unfold interesting

Table XXXVIII

Thermal Properties of Bare and Insulated Roofs

	Thickness, inches			Coefficients		Temperature, ° Fahr.					
Roof	Silica brick	Insulation	Silica brick	Insulation	Combined resistance R	Flame	Inner surface	Maximum insulation*	Outer surface	Emission rate	Heat flow, B.t.u./ sq. ft./hr.
a	b	c	d	e	f	g	h	i	j	k	l
ZB	13½	None	1.125	None	1.125	3148	2724	None	540	11.25	4950
ZC	15	None	1.250	None	1.250	3148	2764	None	520	10.75	4530
ZE	18	None	1.500	None	1.500	3148	2794	None	485	10.00	3850
ZB2	13½	2	1.125	1.625	2.750	3148	2840	1836	385	7.87	2242
ZC2	15	2	1.250	1.625	2.875	3148	2847	1773	377	7.75	2146
ZE2	18	2	1.500	1.625	3.125	3148	2859	1663	367	7.50	2008
ZB4	13½	4	1.125	3.250	4.375	3148	2909	2243	319	6.75	1478
ZC4	15	4	1.250	3.250	4.500	3148	2912	2192	318	6.62	1444
ZE4	18	4	1.500	3.250	4.750	3148	2919	2092	312	6.50	1398

*Figures in this column represent the temperature of the surface of the insulating material at the contact with the silica brick.

and advantageous possibilities of its application, chief of which are the elimination of all the static forces now found in arched roof construction and the consequent inclusion of flat roof design into the furnace structure solely on a dead weight basis. However, it is the same absence of stress within the structure that permits excessive spalling.

Restraining the flat roof in a sufficient degree to reduce spalling seems out of the realm of possibility because sufficient restraint to accomplish this would subject the buckstays to loadings of infinite magnitude. The development of a nonspalling brick having other properties suitable for open-hearth service undoubtedly would assure a more general application of this desirable design.

No further consideration is given this type of roof and this fact should be borne in mind especially as a method of hanging the arched roof to be later described, is termed "suspended." When "suspended" is used hereinafter, therefore, it will have no reference to the flat roof.

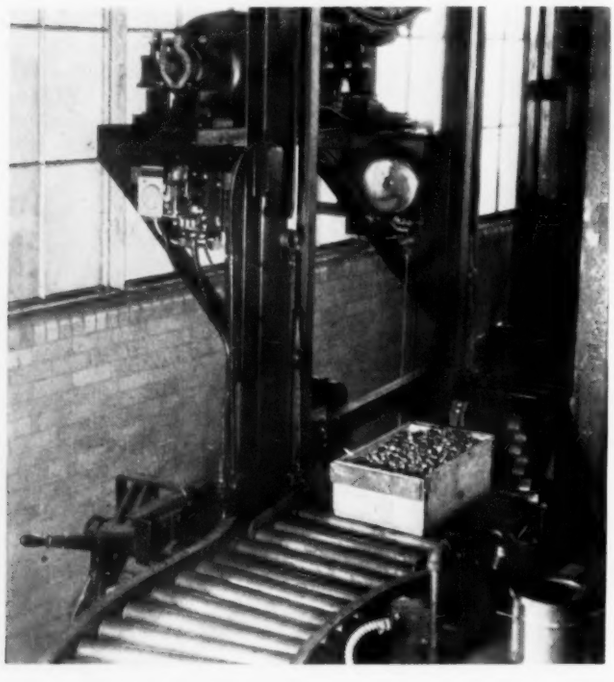
Photoelectric Control Prevents Tote Pans from Piling Up on Conveyor

DIFFICULTY in the transfer of tote pans loaded with bolts to a gravity conveyor was experienced by the Lamson & Sessions Co., a Cleveland manufacturer of bolts and nuts. These pans, weighing from 70 to 150 pounds, are lifted by two endless chains with conveyor carriers and then are lowered and placed on the gravity roller conveyor.

Each pan when placed on the gravity conveyor should slide and make room for the next pan, but frequently this did not happen. This meant that the second pan was deposited on top of the first one, and so on, until a pile of material accumulated.

The problem was solved by installing a light source on one side of the gravity conveyor and a photoelectric relay on the other, as shown in the accompanying illustration. If a pan fails to slide along on the conveyor, it interrupts the beam of light and the phototube promptly actuates the relay, thereby stopping the endless chain and allowing no more tote pans to come down until the blocking pan is shoved along. The photoelectric relay equipment used was manufactured by the General Electric Co., Schenectady, N. Y.

In applications similar to this tote box control, the photoelectric relay could be arranged to actuate an electromechanical device, such as a thrustor, which is a motor controlling a hydraulic cylinder, to push the obstructing box on its way along the conveyor automatically.



PHOTOELECTRIC control utilized to stop the vertical lift when a tote box intercepts the light beam. This prevents the boxes loaded with bolts from piling up on the gravity conveyor when one fails to move as intended. The light beam is placed at an angle as shown to take care of all sizes of boxes

Seek To Improve Status of Engineering Profession

As announced in STEEL, Dec. 12, p. 26, seven national engineering societies have co-operated in the organization of the Engineers' Council for Professional Development, with the announced objective of advancing the professional status of the engineer. Participating groups are: American Society of Civil Engineers, American Institute of Mining and Metallurgical Engineers, American Society of Mechanical Engineers, American Institute of Electrical Engineers, American Institute of Chemical Engineers, Society for the Promotion of Engineering Education and the National Council of State Boards of Engineering Examiners.

Standards Bureau Effects Economy in Operations

With reductions in its personnel and expenditures for the fiscal year ended June 30, 1932, the bureau of standards effected economy in its operations, as compared with the previous year. This information is revealed in the annual report of the director of the bureau to the secretary of commerce, just available in printed form.

The report was submitted by Lyman J. Briggs, who was named acting director following the death of Dr. George K. Burgess on July 2. Dr. Burgess had served as director since April 21, 1923.

The regular staff at the close of the fiscal year numbered 1035 employes. With miscellaneous assignments, the grand total was 1109 persons, a decrease of 62 as compared with last year. As of June 30, research associates numbering 66, representing 28 associations were stationed at the bureau, as compared with 95 associates from 45 associations last year. Despite these reductions, the bureau continued its close co-operation with all government departments and with public and private organizations interested in its work.

Congressional appropriations for the fiscal year 1932, exclusive of nonrecurring items, amounted to $2,749,570. By curtailing certain activities, postponing new lines of work, and exercising special care to insure economical operation, approximately $165,000 was turned back to the treasury. Funds received from other governmental agencies for special investigations amounted to $417,370.

Produces X-Ray Stereoscopic Images in Three Dimensions

X-RAY testing is providing the engineer with an important tool by which the soundness of castings, welded joints and machine members may be studied physically and from a design standpoint. With the rapid strides made in X-ray work during recent years, fluoroscopic equipment now is regarded as a practical instrument for routine inspection of metal products. In this connection, a recent development which makes possible three-dimensional images is particularly significant.

At California Institute of Technology, Pasadena, Calif., Dr. J. W. DuMond and Dr. A. Hoyt have invented and constructed X-ray stereofluoroscopes which will give stereoscopic images, in three-dimensional, plastic relief.

If it is useful for the purpose in hand, the three-dimensional image can be put in front of the fluorescent screen and formed as a "life-sized-ghost" into which calipers can be inserted so that direct measurements can be made with a precision of less than a millimeter. In addition to this the stereofluoroscope is useful anywhere the ordinary X-ray fluoroscope can be used.

Two Sources of Rays

The machine, one of which is shown in the accompanying illustration, consists of two X-ray sources, separated by a distance equal to the interpupilary distance, which flash X-rays alternately 60 times a second. These flashing X-rays cast alternate shadows on a fluorescent screen which is viewed through a synchronous optical shutter or image selector near the eyes. By means of the synchronous shutter each eye sees the series of shadows cast on the screen by its own X-ray source and none of the shadows cast by the other X-ray source. These two different sets of shadows seen separately, one set by each eye, are fused together into a three-dimensional, stereoscopic image.

The limit on the thickness of castings and welds that can be inspected by means of the X-ray stereofluoroscope is set by a characteristic property of the material—its X-ray absorbing power. It is principally this property of the material which sets the limit on the thickness although there is another minor factor involving the characteristics of the human eye in relation to its ability to detect the faint light coming from the fluorescent screen. However a simple calculation shows that if the X-ray tube is run at 150 kilovolts peak, aluminum castings not thicker than 1½ inches could be tested for "blowholes" and flaws which would give fairly sharp contrast.

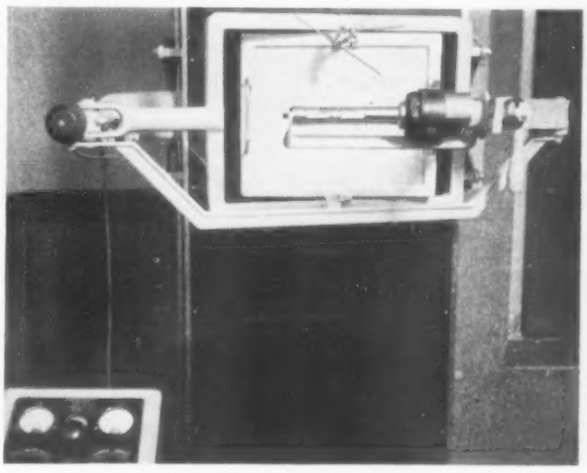
In the instance of iron the limiting testing thickness would be ¼-inch because iron is a material of much higher atomic number. Physicians make use of an X-ray fluoroscope for studying human beings but their requirements are easier to fulfill in that a much lower voltage is needed and any attempt to use one of their standard machines for casting work would result in only about one-quarter the penetration which is obtainable at the present time.

Redesign for Metal Testing

It is apparent that it is possible to build a stereofluoroscope that will be useful in testing small aluminum and iron castings, but it probably is unwise to attempt to adapt existing fluoroscope designs, as has been done for medical work. The thing to do is to build one from the ground up allowing for the increased voltage the specialized job in hand, and more exacting measures for the protection of the operator.

A direct comparison between the study of castings by means of stereophotographs and a stereofluorscope can now be made. Stereophotographs take longer to make, give more detail, make a permanent record of the casting tested, give one "still" three-dimensional picture of the casting and can be obtained of somewhat thicker castings if the exposure time of the film is sufficiently increased.

On the other hand the stereofluoroscope would give much more rapid examination of somewhat thinner castings, furnish no permanent record of castings tested, show a little less detail but give a moving picture in three dimensions of each casting tested. The particular type of castings to be examined and their use will determine to a large extent the type of equipment that will do the testing job most effectively.



AN X-RAY stereofluoroscope constructed at California Institute of Technology and installed in Henry Phipps institute, Philadelphia

Electric Furnace Installed In Canadian Foundry

For basic operation on manganese steels, alloy steels and plain carbon foundry steels the Sorel Steel Foundries, Sorel, Que., has installed a 3-ton electric arc furnace, built by Pittsburgh Lectromelt Furnace Corp., Pittsburgh. The installation has just been completed and goes in as a converter replacement. On the first ten heats the furnace averaged 600 kilowatt hours per ton. The equipment is fully automatic and is arranged so that the operator has a selection of four operating voltages at the switchboard. It is expected that the usual run of heats will average between 3000 and 9000 pounds.

Steel Founders To Meet At Detroit Jan. 19

Steel Founders' Society of America will hold its annual meeting at Detroit, Jan. 19, during the week of the highway and building congress. Headquarters will be at the Hotel Statler. Arthur Simonson, Falk Corp., Milwaukee, as president will preside at the general sessions. Granville P. Rogers, managing director, New York, will report on the society's work. An important paper by Frederick A. Melmoth, president, Detroit Steel Casting Co., Detroit, will be on "United We Stand—." Officers and committees for the ensuing year will be elected.

A special grade of wire is used for making tobacco pipe cleaners, and consumption averages about 50 tons a year. Various types of pipe reamers also are made of steel

Large Uses of Steel In Small Ways

233rd Article ◆ Pipe Cleaners

SMOKERS in this country require normally about 50 tons of light, thin steel wire to keep their pipes drawing easily throughout the 12 months of the year. They require, moreover, a wire that has an exceptionally clean surface and one that is tough and pliable. In fact, there is a special wire for this purpose, which is known in the trade as bright annealed pipe cleaner wire. This is No. 27 gage, or 0.0173-inches diameter.

The wire is woven with cotton, or sometimes wool, yarn especially treated, two strands of wire and one strand of yarn. The work is done automatically with the yarn, slit in a final operation to provide the proper nap. Incidentally, this nap generally is of uniform length, although cleaners now are being made with the nap at one end shorter than that at the other, a feature designed to facilitate the cleaning of a pipe.

The woven strand is cut in uniform lengths, in the case of some brands 6 inches in length, and in others about 6¾ inches. As the wire is crimped in the weaving operation, the two pieces of this material used are longer, although each is not of the same length. In the case of the 6¾-inch cleaner, one piece of wire is 9 inches long, and the other 10½-inches, or 19½-inches of wire to each cleaner.

The wire usually is sold in 10-pound spools, 1253 feet to the pound. This, incidentally, would indicate the production of 770 cleaners for every pound of wire consumed, and on the basis of 50 tons used annually under normal conditions, a production of 77,000,000 cleaners. As a matter of simple compilation, it might further be said that in point of length, the wire consumed annually amounts to about 23,700 miles. The cleaners usually are sold in packs of 24.

In addition to these cleaners, a considerable number of reamers are sold for removing the "cake" in pipes. These reamers are made of steel, with a series of spiral blades, formed to the contour of the pipe bowl. The amount of steel consumed is relatively small compared with that for woven, wire cleaners.

Attend Welding Course

A 3-day course in the arc welding process and theory of design for welded steel construction was held early in November at the plant of the American Rolling Mill Co., Middletown, O., under the direction of E. W. P. Smith, consulting engineer, Lincoln Electric Co., Cleveland. Attendance of designing and electrical engineers, maintenance men and various department heads was compulsory and included about 35. Lectures were supplemented by shop demonstrations.

Institute Meets in January

Gray Iron Institute, Cleveland, announces a general meeting at the Congress hotel, Chicago, Thursday, Jan. 26. A number of new developments affecting the industry will be presented and discussed. Of particular interest will be that portion of the program to be devoted to marketing problems and plans which the technical and merchandising committees of the institute have developed.

Arthur J. Tuscany, 4300 Euclid avenue, Cleveland, is manager of the institute.

HIGHWAY GUARD PROTECTS LIFE AND PROPERTY: Recently introduced by the Tuthill Spring Co., 760 West Polk street, Chicago, this new highway guard comprises the usual anchoring posts with a special ¼ x 10-inch spring steel convex-shaped railguard mounted securely with ½-inch bolts to a 7/16 x 4-inch tempered spring steel support. The supporting spring in turn is bolted to the base of the post. The steel cable at the top is not essential. When an automobile strikes the guard, the bumper action of the spring rail support immediately deflects the car back onto the road, the spring rail being placed at the proper height to receive the impact from bumpers, hub caps, wheels or running boards, thereby eliminating damage to the car body or fenders, it is claimed

Making the Most of

METHODS AND MATERIALS

NITRIDED tools or dies can be softened materially for alterations by immersing them in a bath of fused sodium-potassium nitrate. It is said that the same effect can be accomplished by heating them in aluminum powder up to its melting point of 1220 degrees Fahr. The entire case may be fused away by holding the parts in a molten aluminum bath for several minutes. The nitride needles are not removed from the case but partially diffuse into the steel, although diffusion and decarburization are less than in the salt process. Although the hardness never is reduced to that of the original piece before nitriding, it has been reduced from 937 Vickers brinell to as low as 420, and the piece then is readily machinable.

S S S

RUBBER is useful in many ways to eliminate noise, but here is said to be a new one. A ¾-inch hydraulic pipe in one of the buildings of a large rubber company in Akron, O., developed a noisy water hammer due to fluctuating pressure. No remedy could be found until an engineer substituted a piece of ¾-inch rubber hose for a section of the pipe. This ended the trouble at once.

S S S

When used on aluminum and its alloys, chromium-plated files have been found to work better than the ordinary types. Chromium-plated twist drills showed slight advantages, but not as much as tool bits such as those used for lathe, shaper and planer purposes.

S S S

An installation of thyratron control resistance welding equipment has been made in the plant of an eastern company in connection with the manufacture of oil cans. The side, top and bottom seams are welded by intermittent line welding. Very satisfactory results are said to have been obtained, the company reporting that it is obtaining consistently much better and more uniform welds than has been possible through the use of a number of different types of mechanical interrupters.

S S S

Molded plastics of phenol base compounds are abrasive in nature and because of this they are destructive to tools in machining operations such as drilling. Chips tend to cling to the tools, causing packing and overheating. These tendencies are overcome with special drills having wide highly polished flutes and somewhat slower angles of spiral and usually being specially heat treated to increase their resistance to abrasion. In typical instances it is said that these drills will outperform conventional types of drills several times. Drilling speeds from 100 to 300 surface feet per minute, depending upon the diameter and

depth of holes, are recommended. Feeds per revolution should be maintained approximately the same as those for drilling steel, although in some cases this may be increased considerably. Drilling is done dry as any liquid applied for cooling purposes will cause the chips to gum up.

S S S

In a plant constructing box cars and gondolas a piece of steel fed to a large shear was either tougher than usual or the shear was so weakened by repeated overstrain that it was at the point of collapse. The result was a break in the cast-iron shearing jaw guide and a threatened drop of 12½ per cent in production. To repair the guide by oxyacetylene welding with cast iron welding rod and place the shear in operation again required only three days and cost $600. A new part would have cost $1800 and would have taken a month's time.

S S S

Serious trouble in porcelain enameling of sheet steel has been caused by faulty design. In designing parts, one must keep in mind warpage, strength at the corners and the ease of application of the enamel to certain types of parts. Exaggerated warpage often has been caused by the use of too light a gage of metal, or strain and weak spots due to the original design. Close co-operation between the designer and the enameling department is required to insure successful commercial work.

S S S

A NUMBER of iron-chromium alloys, ranging from 13 to 26.5 per cent chromium, were subjected to a salt spray test recently and all were found to possess excellent resistance to rusting. No direct parallel could be drawn between resistance in the salt spray and rust resistance under service conditions. Conclusions drawn by the investigators were that the test cannot be used to express a direct measure of general corrosion resistance, as for instance, to predict results to be expected from the alloy in resistance to an acid; the test is not very sensitive to differences in analysis, although there is considerable improvement in resistance when the chromium content is increased from 13 to aproximately 17 per cent; the test is not very sensitive to differences in heat treatment when the chromium content is 17 per cent or more; within the limits studied, differences in carbon content do not appear to have any marked effect on resistance to attack; and the shape of the specimens has an effect on salt spray resistance.

S S S

Development of special welding rods now permits welding high-manganese steel castings, containing 10 to 14 per cent manganese. It is now possible also to weld such cast parts to structural steel by a procedure of applying the special welding rod to the casting, standard rods to the structural steel and then welding the two welded sections together.

PROGRESS IN STEELMAKING

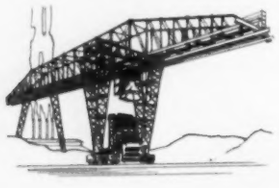
RESISTANCE against the elements, grease, oil, acids and abrasion is claimed for a newly announced compound which impregnates iron and steel and renders the metal impervious to oxidation. The product is an elastic compound to be used as a subcoating or base on railroad equipment, bridges, storage tanks, underground pipes, pipe lines, structural steel and other metal construction. Within 40 minutes after application, the film is dry. It is said to facilitate the adhesion of paint, enamel, lacquer and other finishes to metal without the danger of checking, cracking, peeling or discoloring.

♦ ♦ ♦

Many sheet mill automatic catcher tables now are equipped with photoelectric tubes which serve as flag switches. The sheet in transit through the rolls intercepts a beam of light which causes the photoelectric tube to function and control the conveyor lift motion.

♦ ♦ ♦

Tests recently made on hollow drill steel with a 7/32-inch hole and a 1⅜-inch bit show that a ⅞-inch hexagon section will drill an average of 92 feet of uniform rock before failure; a round steel with the same section area as ⅞-inch hexagon will drill 72 feet; and, a ⅞-inch round will drill 50 feet.



ELIMINATION of the motor jack shaft on ore bridges has been made possible by the development of a worm gear drive. Each end of the driving motor armature is connected through flexible couplings to double reductions housed in oil-tight boxes at either end of the crane. The gear housing is provided with a covered opening through which the worm unit may be removed without disturbing other parts.

INSTEAD of shearing sheet bar into 30-foot lengths and later reshearing to certain foot-pound weights to conform to sheet mill specifications, one producer in this country now is shearing the bars to hot mill sizes as they come direct from the hot bed. A 108 x 1½-inch shear designed for cutting multiple bars is installed at the discharge end of the runout table serving the cooling bed. The shear is equipped with a depressed-type piler which will handle stacks of bars 36 inches high. The piles are moved on supporting beams and then transferred to storage or to the sheet mill pair furnaces.

♦ ♦ ♦

Embrittlement of alloy steel tubing for refinery service has been remedied and its high-temperature creep strength increased by the addition of molybdenum. One producer of this grade tubing for coil tubes used in the cracking process is employing a steel containing 4 to 6 per cent chromium and 0.40 to 0.65 per cent molybdenum.

♦ ♦ ♦

Better surfaced ingots and the elimination of some inclusions are claimed by an open-hearth shop which employs an auxiliary ladle at the pouring station. The secondary unit of 10 tons capacity is suspended from the crane beneath the 115-ton ladle into which the heat is tapped. Steel from the main ladle is poured into the smaller vessel and thence into the mold thereby reducing the ferrostatic pressure. The same kind of brick and the same size nozzles, namely 2¼ x 1¾ inches, are used in each ladle. To avoid excessive skulling, the small ladle is kept hot between heats.

♦ ♦ ♦

First-quality fireclay brick are being replaced at many plants with high-alumina brick (50 to 80 per cent alumina) in the top checkers and water-cooled ports of open hearths and in the well wall and top courses of the checkers of blast furnace stoves.

♦ ♦ ♦

Whenever excessive drafts are taken or the steel is rolled on the cold side at the plant of an Ohio steelmaker, the rolling mill operators are warned by a signal lamp which is connected with a load limitator. By this arrangement the power consumption is minimized.

♦ ♦ ♦

Cleaning the floors of a steel plant in the Pittsburgh district is being effected at a cost of $0.26 per 100 square feet by the use of a high-pressure spray system. This compares with a cost of $1.55 per 100 square feet by the push broom method and represents a savings of $4615 annually.

BRAKES arranged for both magnetic and air release now are available for preventing excessive drift of hot metal mixers.

NEW EQUIPMENT

PRODUCTION FABRICATION TREATMENT FINISHING

Compactness Is a Feature of Motor Reduction Unit

Allis-Chalmers Mfg. Co., Milwaukee, announces the development of a motor reduction unit, shown herewith, for use where low speed drives are required. A standard round frame type motor is mounted directly on the gear reducer housing thus forming a compact unit. Standard speeds at the power take-off are from

Motor reduction unit built by Allis-Chalmers Mfg. Co.

3.02 to 380 revolutions per minute, but lower speeds can be provided; 6.08 revolutions per minute is obtained with the use of a 1750 revolutions per minute motor.

Bearings supporting the gear drives are ball or roller type. Lubrication is automatic and continuous. Standard units are arranged for floor mounting. Units can be supplied for wall, ceiling or vertical mounting. Any desired type of motor may be supplied. Inherent advantages of separate motor and reducer construction are maintained such as ease of maintenance, replacement of individual units, adaptability to change in ratios, etc.

◆

Pillow Block Pedestals Are Developed

Norma-Hoffmann Bearings Corp., Stamford, Conn., has announced a new line of unit pedestals for pillow blocks, adaptable to all average industrial requirements. The units are available in sizes to fit standard shafting in nominal inch as well as sixteenth diameters from 15/16 to 3½ inches. Ball bearings in the unit, shown herewith, are the standard double row, self-aligning type with adapter sleeve manufactured by the company.

The pedestals have capacity for a large volume of lubricant with fittings for replenishing as needed. Protecting felt seals prevent escape of lubricant along the shaft. These pedestals may be had with bearings either floating or fixed in the housing. In the latter case suitable distance pieces are furnished for clamping the outer ring.

◆

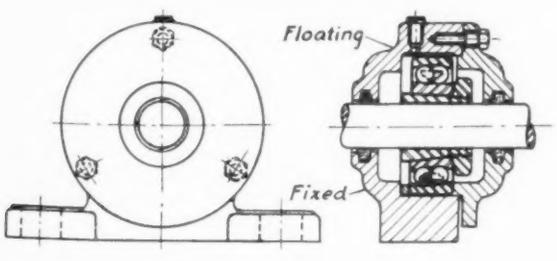
Reducer Employs Any Type of Motor

Louis Allis Co., Milwaukee, recently placed on the market a line of motorized speed reducers which may employ nearly any type of motor. The motor and speed reducer are com-

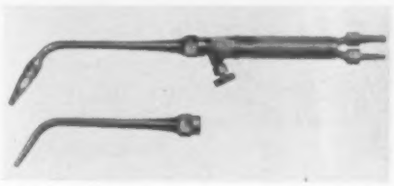
Motorized speed reducer manufactured by Louis Allis Co.

bined into a self-contained unit which may be mounted easily on the machine. Ratings available are ¾ to 75 horsepower with output speeds of 4 to 400 revolutions per minute.

These units can be furnished with motor characteristics and style of mounting best suited to each application. The integral style, shown herewith, in which the end bell is removed and the motor close-coupled to the gear casing, is most common where an open motor or an enclosed nonventilated motor is employed. The flexible style, in which the entire motor without any change is mounted on the gear casing, is furnished where conditions require an explosion proof, splash proof or other protected type of motor. Either style can be furnished to provide normal starting torque, high starting torque, high slip, adjustable speed, multispeed or other desirable characteristics that can be built into separate motors.



PROTECTING felt seals prevent escape of lubricant in pillow block pedestals recently developed by Norma-Hoffmann Bearings Corp.



Type W-22 welding blowpipe introduced by Linde Air Products Co.

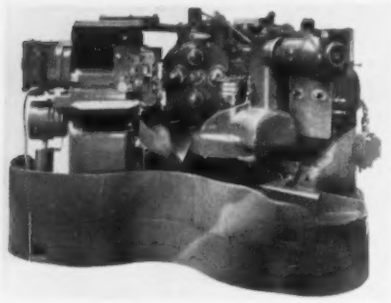
◆

Welding Blowpipe Has Ball Type Acetylene Valve

Linde Air Products Co., 30 East Forty-second street, New York, just has announced a new welding blowpipe, designated as type W-22. Although it has been developed primarily for use on pipe line work, its application is not restricted to this field.

The new blowpipe, shown above, is similar to type W-17 welding blowpipe except that the oxygen and acetylene valves are located on the front of the handle. A feature of the blowpipe is the long acetylene passageway between the acetylene valve and the injector which minimizes the possibility of flashback. This is accomplished by having three acetylene tubes between the rear and front bodies. Thus, the acetylene comes from the hose connection up to the valve in the front body, passes through a second tube back to the rear body, thence through a cross drilling to a third tube leading to the injector.

The ball-type acetylene valve is another feature of the blowpipe. This



Gleason completing generator for rough and finish cutting gears

valve consists essentially of a stainless steel sphere which is hardened and ground with extreme accuracy by a new process. The sphere gives a narrow line of contact and eliminates any difficulties which might be caused by the deposition of carbon in the valves.

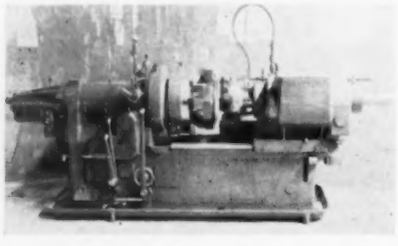
◆

Unit Completes Roughing and Finishing of Gears

Gleason Works, 1000 University avenue, Rochester, N. Y., recently introduced a completing generator designated No. 9, for rough and finish cutting differential gears and pinions. These two operations formerly were done on two machines. Combining them in one machine eliminates one chucking and dechucking operation, eliminates stock dividing, handling and moving of roughed out blanks, etc.

The machine, shown in the illustration directly above, is loaded manually by placing a blank on the spindle in the uppermost loading station. The blank is secured in place automatically and the turret advances it to the roughing station. When this operation is completed the turret advances to an intermediate station and then to the finishing station.

After the machine has completed its first cycle, the operation is continuous and as each spindle arrives at the loading station a finished gear or pinion is removed and a blank is loaded, while the cutting is in progress at the other two stations. Thus, one finished gear or pinion is obtained for every 90 degrees of index of the turret drum.



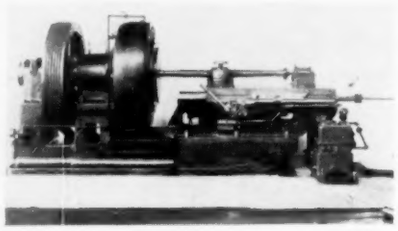
Gisholt specialized machine for boring automotive brake drums

◆

Swaging Unit Has Hydraulic Feeding Mechanism

Langelier Mfg. Co., Providence, R. I., has designed a swaging machine that has a capacity rating of 4 inches on tubing. The unit, shown herewith, is equipped with a semiautomatic hydraulic feeding mechanism tooled to handle automobile rear axle housings. Operation comprises the reducing of both ends after forming and welding, thereby thickening the wall to compensate for the metal removed in a subsequent turning operation and also to increase the strength at this point.

Swager head is the two die type



Langelier Swaging machine tooled to handle axle housings

and is provided with a water jacket so that the machine can be used for hot or cold swaging. The spindle is mounted in sleeve bearings and an outboard or back bearing is located beyond the flywheel.

◆

Introduces Unit for Machining Brake Drums

Gisholt Machine Co., Madison, Wis., has developed a new unit embodying radical departures from customary brake drum machining practice. The unit, shown in the illustration at the left, is employed for roughing out a front wheel hub and brake drum consisting of a single special malleable casting.

Replacing the standard traversing platen table is a fixed tailstock housing, which carries a boring spindle actuated by a large diameter continuous cylindrical cam and the necessary gearing to complete the feed mechanism. In place of the customary air chucking equipment is a wrenchless chuck operated by an air cylinder mounted on the rear side of the machine, leaving the bore of the work spindle clear for the addition of a back boring attachment.

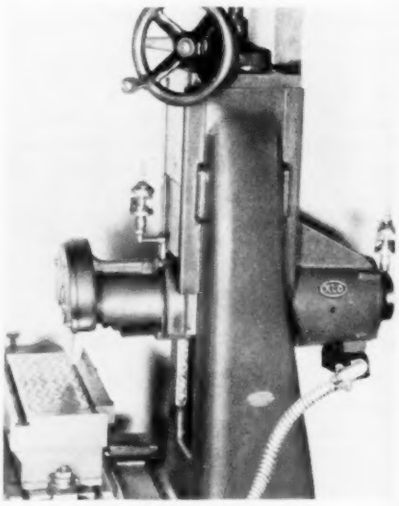
When the machine is started, all tools traverse rapidly to their starting positions. The boring head carries twelve tools for roughing out the 14 x 3-3/16-inch braking surface, and six tools for the inside tapered roller bearing seat in the hub. Back boring attachment holds a six cutter boring head for the outside tapered roller bearing.

◆

Designs Spindles for Surface Grinders

Ex-Cell-O Aircraft & Tool Corp., 1200 Oakman boulevard, Detroit, announces two new direct motor driven grinding spindles for Brown & Sharpe No. 2 surface grinders. The accompanying illustration shows the heavy duty inbuilt motor driven spindle with special holding bracket. Grinding spindle and motor are both mounted on a common shaft. The special bracket replaces the bracket furnished with the grinder. At the back of the bracket provision is made for pressing the motor field into place. The section housing the motor is heavily ribbed. Sufficient stock is left on the bracket to fit to the ways of the machine.

The other is a standard type of direct motor driven spindle that can be fitted into the regular Brown & Sharpe bracket. By boring the



Ex-Cell-O heavy duty inbuilt motor driven grinding spindle

bracket out to three inches this new spindle can be slipped into place. Two holes are drilled and tapped in the bottom of the bracket for set screws to hold the spindle from turning.

December Steel Rate Holds Above Year's Low

Despite Sharp Contraction for Holidays, Some of Fall Gain Retained —Bridge Makes Shape Awards Second Best of 1932—Ferrosilicon Cut

SEVERELY as steel production has been pruned back over the holidays, to about 12 per cent in the week ended Dec. 24 and possibly a point lower in the week ended Dec. 31, it is not believed that the average daily rate for December will decline to the level of the alltime low of August.

Shutdowns scheduled for Dec. 23 to 27 were the most sweeping in the history of the industry, but the fear that they would carry through the week will not be realized, inasmuch as automotive releases, especially for sheets and strip, will unexpectedly restore some capacity Dec. 27.

As usual, consumers have permitted their inventories to run down, and while many have signed contracts for the first quarter, they have not specified. Producers, however, expect that with the turn of the year specifying will be resumed, and they look to January to bring some measure of improvement.

Structural steel awards approach the year-end with the second highest total for any week this year—70,663 tons—due largely to the placing of the steel for the federal-aid Belt Line railroad bridge at New Orleans. On Wednesday the American Bridge Co. is scheduled to receive a formal order for 20,000 tons for the main span, and the McClintic-Marshall Corp. 40,000 tons for approaches. The 3020 tons for a viaduct at Newark, N. J., has been closed by the Phoenix Bridge Co.

Revival of the New York Central railroad St. John's Park terminal warehouse in New York brings 20,000 tons of structural material up for bids shortly. Inquiry for sheet piling is broader at New York, while bids are in on 5690 tons for a sea wall at Seattle. Public work is going ahead faster in the Pacific Northwest. Buffalo understands that the R. F. C. views more favorably the Grand Island bridge project, requiring over 12,000 tons.

In the distribution of steel sheets for bodies for new models, Ford has included a Chicago mill. Excepting Plymouth and Buick, first of the large-scale producers to start, automobile manufacturers are maintaining high rates of assembly on new models, and December output will approximate the 111,141 units of July. For January the outlook is equally good.

Many railroads are generous buyers of rivets, indicating an early start on car repair programs. Many roads also are in the market for miscellaneous steel requirements for the first quarter, usually 2500 tons or under. The Santa Fe, which has just distributed 26,484 tons of rails, is inquiring for about 3000 tons of fastenings. With the rail wage matter settled until Oct. 31, one more impediment to placing of rails for 1933 laying is removed.

Bids are in at Seattle on 5800 tons of cast iron pipe, while Chicago will lay 5000 tons as a result of R. F. C. assistance.

Of finished steel products, sheets are the most active, due to automotive releases, and strip second. Because tin plate is so firmly held on the new basis of $4.25, consumers are under no incentive to commit.

An exception to easy demand for pig iron is the situation at Chicago, where the decline in December shipments is less than anticipated and an upturn is expected in January. An inquiry for basic iron at Pittsburgh probably will lead to an order for 5000 tons. Foundry and domestic coke is moving well, and the inventories of some ovens have been reduced gratifyingly.

Scrap is in no demand and prices are nominal, leaving STEEL's composite of steelworks scrap unchanged at $6.29. Concrete billet bars are being stabilized. Ferrosilicon has been reduced $3 per ton, to $74.50, with corresponding adjustments in silicon and chrome briquets and allied products. But these do not affect the iron and steel composite of STEEL, which holds at $28.91, or the finished steel index at $46.70.

Composite Market Averages

	Dec. 24	Dec. 17	One Month Ago Nov., 1932	Three Months Ago Sept., 1932	One Year Ago Dec., 1931	Ten Years Ago Dec., 1922
Iron and Steel Composite	$28.91	$28.91	$29.12	$29.32	$30.32	$40.53
Finished Steel Composite	46.70	46.70	47.20	47.50	47.74	58.39
Steelworks Scrap Composite	6.29	6.29	6.87	7.04	8.16	17.28

Iron and Steel Composite:—Pig iron, billets, slabs, sheet bars, wire rods, tin plate, nails, sheets, plates, shapes, bars, and black pipe. Finished Steel Composite:—Plate, shapes, bars, hot strip, nails, tin plate, pipe. Steel Works Scrap Composite:—Melting steel, compressed sheets.

COMPARATIVE PRICES OF IRON, STEEL AND COKE

Representative Market Figures for Current Week, Last Month, Three Months and One Year Ago

	Dec. 24, 1932	Nov. 1932	Sept. 1932	Dec. 1931
Pig Iron				
Bessemer, del., Pittsburgh	$15.76	15.76	15.76	17.51
Basic, valley	14.00	14.00	14.00	15.00
Basic, eastern, del. eastern Pa.	13.50	13.50	13.75	16.00
No. 2 foundry, del. Pittsburgh	15.76	15.76	15.76	17.51
No. 2 foundry, Chicago	15.50	15.50	15.50	16.60
*Southern No. 2, Birmingham	11.00	11.00	11.00	12.00
**No. 2X, Virginia furnace	17.75	17.75	17.75	18.00
**No. 2X, Eastern, del., Phila.	13.76	13.95	14.26	16.01
Malleable, valley	14.50	14.50	14.50	16.10
Malleable, Chicago	15.50	15.50	15.50	16.60
Lake Superior charcoal, del. Chi.	23.04	23.04	23.04	20.79
Gray forge, del. Pittsburgh	15.63	15.63	15.63	16.88
Ferromanganese, del. Pittsburgh	73.24	73 24	73.24	84.79
Coke				
Connellsville, furnace, ovens	1.75	1.80	2.00	2.30
Connellsville foundry, ovens	2.50	2.65	2.75	3.25
Semifinished Material				
Sheet bars, open-hearth, Youngs.	26.00	26.00	26.00	28.25
Sheet bars, open-hearth, Pitts.	26.00	26.00	26.00	28.00
Billets, open-hearth, Pittsburgh	26.00	26.00	26.00	29.00
Wire rods, Pittsburgh	37.00	37.00	37.00	35.00

*1.75-2.25 silicon. For local delivery. Northern shipments based on $10, Birmingham. **2.25-2.75 silicon.

Delivered pig iron prices subject to 10 per cent freight surcharge, maximum 13.44c per gross ton, beginning Jan. 4, 1932.

	Dec. 24, 1932	Nov. 1932	Sept. 1932	Dec. 1931
Finished Material				
Steel bars, Pittsburgh	1.60	1.60	1.60	1.60
Steel bars, Chicago	1.70	1.70	1.70	1.60
Steel bars, Philadelphia	1.91	1.91	1.91	1.89
Iron bars, Chicago	1.65	1.65	1.65	1.60
Shapes, Pittsburgh	1.50	1.60	1.60	1.50
Shapes, Philadelphia	1.75	1.75	1.75	1.695
Shapes, Chicago	1.70	1.70	1.70	1.60
Tank plates, Pittsburgh	1.60	1.60	1.60	1.50
Tank plates, Philadelphia	1.69½	1.77	1.79½	1.735
Tank plates, Chicago	1.70	1.70	1.70	1.60
Sheets, No. 10 blue anneal., Pitts.	1.70	1.70	1.70	1.85
Sheets, No. 24, hot ann., Pitts.	2.10	2.10	2.10	2.40
Sheets, No. 24 galvan., Pitts.	2.85	2.85	2.75	2.90
Sheets, No. 10 blue anneal., Chi.	1.85	1.85	1.85	2.00
Sheets, No. 24 hot ann., Chi.	2.25	2.25	2.25	2.55
Sheets, No. 24 galvan., Chi.	2.90	2.90	2.90	3.05
Plain wire, Pittsburgh	2.20	2.20	2.20	2.20
Wire nails, Pittsburgh	1.95	1.95	1.95	1.95
Tin plate, per base box, Pitts.	4.25	4.50	4.75	4.75
Scrap				
Heavy melting steel, Pitts.	$8.50	9.15	9.50	10.25
Heavy melting steel, eastern Pa.	6.50	7.25	7.25	7.60
Heavy melting steel, Chicago	5.25	5.60	5.75	7.50
No. 1 wrought, eastern Pa.	6.50	7.25	7.25	9.50
No. 1 wrought, Chicago	5.00	5.00	5.00	7.45
Rails for rolling, Chicago	8.25	8.25	7.00	10.00

Sheets

Additional Automotive Orders Feature Northern Ohio Markets —Other Industrial Lines Quiet

SHEET PRICES, PAGE 35

Cleveland—Sheet mill operations here and nearby will resume Dec. 27 with practically the same rates at which they left off Dec. 24, at 25 to 35 per cent, due to additional automotive orders and releases. A substantial portion of Chevrolet's latest purchase, for the Fisher Body Co. here, came to mills in this district. Automotive business will sustain mill operations at current levels well into January, when the verdict of the automobile shows is expected to foreshadow further programs. Ohio is taking bids at Columbus to Dec. 30 on 1000 tons of license tag stock, either in cold rolled pickled sheets, or strip. Two barrel manufacturers purchased material here during the week. Refrigerator manufacturers indicate some renewal of activity in January. Except for occasional shading by some of the smaller mills, prices are steady, though there is a dearth of contracting for first quarter.

Boston—On a limited volume of sales, prices generally are steady or firm. Some jobbers are buying so close that they order from the mills for quick delivery accordingly as they book orders. Dullness prevails in all grades. New Hampshire is buying automobile tag stock.

New York—Sheet business is listless, with prices unchanged and untested. Sellers believe that by the middle of January enough tonnage will have come out to test the market. Galvanized sheets appear to be moving more actively than other grades, and are holding at 2.85c, Pittsburgh.

Philadelphia — Larger demand, particularly from autobody manufacturers, is expected after Jan. 1. Substantial buying by a sheet fabricator for Plymouth car bodies is contemplated early in the month. The Budd Mfg. Co., this city, has been awarded several hundred tons of automobile license plates by New Jersey. Sheet prices in general appear steady.

Pittsburgh—A fair tonnage of sheets for January shipment has been booked by mills in this district. Prices continue nominal on many grades as competitive influences continue to unsettle some markets. Buying by one automotive interest was reported last week, but automotive specifications in general have been only sufficient for cars made for stock. Galvanized sheets generally are quoted 2.85c, black 2.10c to 2.20c, tin mill black 2.30c, and both heavy and light cold rolled are unchanged at 2.00c and 2.50c, respectively. Chrysler Corp. has received prices on its blanket inquiry for first quarter.

Cincinnati—Mill operators in this district reflect inactivity in the sheet market, brightened only by the steady, but moderate demand by automotive interests. Contracting for first quarter is slow.

Chicago—Sheet business is comprised of small individual lots and total tonnage has declined steadily over recent weeks. Mill operations are irregular, averaging around 10 per cent. Some seasonal improvement is anticipated for January. Farm implement manufacturers continue to buy sparingly. Prices generally continue 2.30c, base, for hot-rolled annealed, and 2.95c for galvanized.

St. Louis — Sheet prices remain quotably unchanged but actual test is lacking, producers and distributors reporting no change in the dull conditions noted since the middle of October. Railroad equipment builders remain out of the market.

Birmingham, Ala.—Mill stocks of sheets are low and production continues at a slow rate. Some new business is reported in prospect.

CURRENT FINISHED STEEL PRICES

Delivered prices subject to freight surcharge corrected to nearest ½c. Asterisk denotes price change this week

Steel Sheets

HOT ROLLED No. 10
(24 to 48 inches wide)

Pittsburgh, base	1.55c
Gary, Ind. Harbor, base	1.65c
Chicago, delivered	1.70c
New York, delivered	1.90c
Birmingham, base	1.70c
Philadelphia, delivered	1.86c

BLUE ANNEALED NO. 9-10

Pittsburgh, base	1.70c
Chicago, district mills	1.80c
Chicago, delivered	1.85c
Philadelphia, delivered	2.01c
New York, delivered	2.05c
St. Louis, delivered	2.04c
Birmingham, base	1.85c
San Francisco c.i.f.	2.32½c

HOT ROLLED ANNEALED NO. 24

Pittsburgh, base	2.10c to 2.20c
Gary, Ind. Harbor, base	2.20c to 2.30c
Chicago, delivered	2.25c to 2.35c
New York, delivered	2.45c to 2.55c
Philadelphia, del.	2.41c to 2.51c
Birmingham, base	2.35c
St. Louis, delivered	2.54c
San Francisco, c.i.f.	2.85c
Detroit, delivered	2.28½c

GALVANIZED NO. 24

Pittsburgh, base	2.85c
Gary, Ind. Harbor, base	2.95c
Chicago, delivered	3.00c
Philadelphia, delivered	3.16c
New York, delivered	3.20c
Birmingham, base	3.00c
St. Louis, delivered	3.19c
San Francisco, c.i.f.	3.50c

AUTOBODY NO. 20

Pittsburgh, base	2.55c to 2.65c

FURNITURE

Pittsburgh, No. 10 heavy	2.40c to 2.50c
Pittsburgh, No. 20 light	2.90c to 3.00c

TIN MILL BLACK NO. 28

Pittsburgh, base	2.30c
Gary, base	2.40c
St. Louis, delivered	2.67½c

HEAVY COLD ROLLED NO. 10

Pittsburgh, base	2.00c
Gary, Ind. Harbor, base	2.10c
Chicago, delivered	2.15c
Philadelphia, delivered	2.31c
New York, delivered	2.35c

COLD ROLLED NO. 20

Pittsburgh, base	2.50c
Gary, Ind. Harbor, base	2.60c
Chicago, delivered	2.65c
Philadelphia, delivered	2.81c
New York, delivered	2.85c

Wire Products

(Prices apply on straight carloads. Mixed and joint carloads take 10 cents higher price; pool carloads 25-cent advance; less carloads 40-cent advance.)

F.o.b. mills, 100 lb. keg

Standard wire nails	$1.95
Cement coated nails	1.95
Galvanized nails	3.95

(Per pound)

Polished staples	2.65c
Galvanized staples	2.90c
Barbed wire, gal.	2.60c
Annealed fence wire	2.35c
Galvanized wire	2.80c
Woven wire fencing (9-11 gage)	$55.00
(12½ gage and lighter)	$60.00

(To Manufacturing Trade)

Plain wire, 6-9 gage	2.20c
Spring wire	3.20c

Chicago and Anderson, Ind., $1 over Pitts.-Cleve.; Duluth and Worcester, $2 higher; Fairfield, Ala., $3 higher.

Steel Plates

Pittsburgh, base	1.60c
Philadelphia, del.	1.69½c to 1.79½c
New York, delivered	1.80c to 1.90c
Boston, delivered	1.92c to 2.02c
Buffalo, delivered	1.85½c
Chicago, base	1.70c
Cleveland, delivered	1.78½c
Birmingham, Ala. base	1.75c
Coatesville, Pa., base	1.60c to 1.70c
Pacific Coast, c.i.f.	2.00c
St. Louis, delivered	1.94c

Structural Shapes

Pittsburgh, base	1.50c to 1.60c
Philadelphia, delivered	1.75c
New York, delivered	1.87c
Boston, delivered	2.00½c
Chicago, base	1.70c
Cleveland, delivered	1.78½c
Lackawanna, N. Y., base	1.70c
Birmingham, Ala., base	1.75c
Pacific Coast, c.i.f.	2.10c
Do., wide flange	2.20c

Bars

SOFT STEEL

Pittsburgh, base	1.60c
Chicago, base	1.70c
Birmingham, Ala., base	1.75c
Lackawanna, N. Y., base	1.70c
Pacific Coast, c.i.f.	2.00c
Cleveland, base	1.65c
Philadelphia, delivered	1.91c
New York, delivered	1.95c
Boston, delivered	2.02c
Pittsburgh, cold finish	1.75c
Pittsburgh, forg. qual.	1.85c
San Francisco, c.i.f.	2.10c

RAIL STEEL

Chicago Heights	1.50c
Eastern mills	1.35c

IRON

Chicago, base	1.60c to 1.65c
New York, delivered	1.85c to 1.90c
Philadelphia, delivered	1.81c to 1.86c
Pittsburgh, refined	2.70c to 4.20c

REINFORCING

*Pitts., billet cut lengths	1.65c
*Pitts., stock lengths, mill	1.50c
Chicago, billet	1.50c to 1.60c
Chicago, rail steel	1.20c to 1.30c
*Philadelphia, cut lengths	1.76c to 1.86c
Cleveland, cut lengths	1.75c

Cold-Finished Bars, Shafting

Base Pittsburgh for one size, shape and grade for shipment at one time to one destination

10,000 to 19,999 pounds	1.70c
20,000 to 59,999 pounds	1.65c
60,000 to 99,999 pounds	1.60c
100,000 pounds and over	1.57½c

Chicago, Cleveland, Buffalo 5c higher; Detroit, 20c; eastern Michigan 25c

Corrosion, Heat Resist. Alloys

Base, Pittsburgh

18 per cent chrome, 8 per cent nickel Sheets, 35c; plates, 31c; bars, 28c.

	A	B	C	D
Bars	19c	20.5c	23c	28c
Plates	21c	22.5c	25c	30c
Sheets	26c	27.5c	30c	35c
Hot Strip	19c	20.5c	23c	28c
Cold Strip	25c	26.5c	29c	34c

Carbon 0.12 and under; no nickel. A has chrome 15% and under. B over 15/18% inc., C over 18/23% inc., D over 23/30%.

Tin and Terne Plate

Per 100-pound box, Pittsburgh

Tin plate, coke base, cont.	$4.25
Tin plate, coke base, stock	3.75
Long ternes, 24, unassorted	2.80

Gary, Ind., base 10 cents higher

Alloy Steel

Hot Rolled—F.o.b. Pittsburgh, Buffalo, Chicago and Massillon, O.

Hot rolled; base 2.45c to 2.65c, mills; differentials to various consumers

S.A.E.	Alloy Diff.	4600 .20 to .30 Mo. 1.25-1.75 Ni. 1.05
2000	0.25	5100 80 - 1.10
2100	0.55	Cr. 0.45
2300	1.50	5100 Cr.
2500	2.25	spring 0.20
3100	0.55	6100 bars 1.20
3200	1.35	6100 Spring 0.95
3300	3.30	Cr., Ni., Van. 1.50
3400	3.20	Carbon van 0.95
4100 .15 to .25 Mo	0.50	9250 (flats) 0.25
		9250 (rds., sq.) 0.50

Strip, Hoops, Bands

Hot-rolled strip up to 23 15/16 in. wide Pitts.	1.45c
Do., Chicago	1.55c
Do., del. Philadelphia	1.76c to 1.81c
Do., del. New York	1.80c to 1.85c
Cooperage hoop, Pitts.	1.55c to 1.60c
Do., Chicago	1.65c to 1.70c
Cold-roll, strip, Pitts., Cleve.	2.00c
Worcester, 3 tons or over	2.20c

Rivets, Wrought Washers

Struc., c.l., Pitts-Cleve.	2.25c
Struc., c.l., Chicago	2.35c
7/16-in. and smaller, Pitts., Chicago, Cleveland	70, 10 and 5 off
Washers, c.l., Pitts. dist.	$6.50 to 6.75 off
Do., Chicago district	7.00 to 7.50 off

Rails, Track Material

Standard rails, mill	$40.00
Relay rails, Pitts, 20 to 45 lbs.	$21.00 to 23.00
50 to 75	18.00 to 20.00
80 to 100	23.00 to 25.00
Light rails, 25-45, mills	$30.00
Light rails, Chicago	$32.00
Angle bars, mills	2.55
Spikes, railroad, mills	2.40c
Spikes, boat, barge, Pitts.	2.65c
Track bolts, Chicago	3.50c
do., standard, jobbers	73 off list
Tie plates, Pitts.	$35.00
Tie plates, Chicago	$35.00

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chi. Discounts to legitimate jobbing or large consuming trade for full-case lots apply to May 10, 1930, lists.

CARRIAGE BOLTS

All sizes, cut thread ..... 75 off
Rolled thread ⅜ x 6 and smaller take 10 per cent lower list.
Eagle list ..... 75 off

MACHINE BOLTS

All sizes, cut thread, lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts, stud bolts without nuts ..... 75 off
Tire bolts ..... 60 and 10 off
Stove bolts, 77½, 25 and 10 off in pkgs.; 86 off in bulk.
Rolled thread machine bolts, ⅜ x 6 and smaller take 10 per cent lower list.

NUTS

Semifinished ..... 75 off

HEXAGON CAP SCREWS

Milled ..... 80-25 off
Upset 1 in. diam. and smaller 80-25-10 off

SQUARE HEAD SET SCREWS

Upset, 1 in. and smaller ..... 75-10-10 off
Headless set screws ..... 75-10 off
Upset, larger than 1 in. ..... 75-10 off

Cut Nails, Chain, Piling

Cut nails, c.l. Pittsburgh	$2.50
Do., less carloads, 5 kegs or over	$2.90
Less than 5 kegs	$3.05
Steel sheet piling, Pitts.	1.90c

Bars

Small Lots Make Only Buying —Rail, Automotive, Farm Needs Taper in Holiday Season

BAR PRICES, PAGE 35

Chicago—While steel bar specifications are moderately less active, the decline so far this month has been no greater than anticipated. Automotive requirements continue a leading support to demand, while purchases by farm implement manufacturers are in small lots and show no improvement. Miscellaneous consumers are curtailing purchases, although producers look for an upturn in January. Prices continue 1.70c, Chicago, for soft steel bars. Rail steel is 1.50c and bar iron 1.60c to 1.65c.

Boston—Commercial and alloy steel bar demand continues light. Bolt and nut makers and other fairly steady buyers show little interest in first quarter needs. Merchant bars on the small volume moving are generally steady at 1.60c, Pittsburgh.

Philadelphia — Commercial steel bars are steady at 1.60c, Pittsburgh, and common iron bars at 1.50c to 1.55c. Except for some modest tonnages of steel bars for ship work, inquiry is for small lots.

Pittsburgh—Soft steel bars were specified in even smaller amounts last week. A few customers were in the market with small orders but the season's dullness made for widespread inactivity. A large mill here, with largely bar capacity, did not begin rolling until mid-week and then only for a few turns. Bars for cold-finishing purposes are in better demand, although reinforcing bar orders were fewer last week. Unchanged markets prevail, 1.60c generally being named on soft steel bars. Alloy steel bars are 2.45c to 2.65c, Pittsburgh.

Cleveland—Consumers are extending contract arrangements with regular sources of supply for first quarter, on a basis of 1.65c, base, Cleveland, for merchant steel bars. Specifications are light, automotive and railroad releases having tapered in the last few days.

Cold-Finished Ends Year With Few Orders Placed

Cold Finished Prices, Page 35

Pittsburgh — December generally was below October in point of cold-finished bar shipments and specifications. However, a few fair orders for January delivery placed last week not only represented a more diversified demand but saved the month from being much below the November rate. Of these orders a few were for automotive accounts, some for jobbers and smaller commitments by miscellaneous buyers. Firmness is noted in the base price of 1.70c, Pittsburgh, for 5 to 10-ton lots for shipment at one time to one destination.

Tin Plate Mills Slower, Producing for Stock

Tin Plate Prices, Page 35

Pittsburgh—A firm price of $4.25 per base box and customers' indifference toward stocking tin plate have resulted in few contracts recently. However, many sizable contracts came through in December and were sufficient for district tin mills to produce at an average of 35 to 40 per cent for the month. Several mills still are producing for stock. Next week the operating rate in district tin mills will decline, but not below 30 per cent. The early part of last week Wheeling Steel Corp. put on six additional mills at its Yorkville, O., works, the highest operating rate for any period of the year.

New York—Canmakers generally are agreed that 1933 requirements of tin plate will exceed those of the current year. Leading makers are withholding contracts, but are releasing an increasing volume of specifications.

Semifinished Steel Requirements Slow

Semifinished Prices, Page 42

Billet and sheet bar buyers have been assured of unchanged price levels for first quarter and are anticipating their needs slowly. Few orders for January delivery have been entered by semifinished steel producers. Tin plate mills are taking the largest tonnage. Forging billets and wire rods are in slow demand.

Plates

Eastern Markets More Active— 5300 Tons Placed for Cruiser— Railroad Demands Coming Out

PLATE PRICES, PAGE 35

New York—The market is more active, one leading seller reporting the best sales here in several weeks, comprising scattered tonnages. Recent business includes about 700 tons of plates for an eastern pipe project, and several hundred tons for New York Central railroad repair work. Platemakers are figuring on 6500 tons of plates for caissons for the San Francisco-Oakland bridge, bids to be opened early in January. A sizable tonnage of plates will be required for the New York Central railroad's St. John's Park terminal on bids Dec. 27. Plate prices continue irregular.

Boston—Two boiler shops are fairly active, one taking several cars of plates recently. For a tow boat, the Bath, Me., shipyard has bought 125 tons. While 1.70c, Coatesville, Pa., will be quoted on car lots for next quarter, some sellers are shading this on current business.

Philadelphia — Ship work dominates the plate market, with the recent placing of cruiser No. 39, requiring 3500 tons of hull plates and 1800 tons of special armor plate, with the Bethlehem Shipbuilding Corp., Quincy, Mass. Makers are figuring on a ferry boat for the Virginia Ferry Corp., Norfolk, Va., requiring 700 tons of plates, 300 tons of shapes and 60 tons of bars. The cruiser, as reported in STEEL, will take a total of 7300 tons of various types of steel. About 1200 tons are required for a drydock caisson at the Norfolk, Va., navy yard, for which project Dravo Contracting Co., Pittsburgh, is low. Pending further test of 1.70c, Coatesville, announced by leading sellers for next quarter, the current market is 1.60c to 1.70c on carlots.

Pittsburgh—Prices are being submitted on blanket inquiries from several of the leaing railroads. Chesapeake & Ohio's inquiry is reported as around 1000 tons for car repair work. About 700 tons for fifty 70-ton gondolas for the Wheeling & Lake Erie have been bought by the Canton Car Co., Canton, O., from a Pittsburgh plate mill. Aside from weakness in the East, plates largely

are based on 1.60c, Pittsburgh. River barge orders from some of the Ohio river transportation companies are promising but are held up pending possible discriminatory legislation.

Cleveland—An order for 50 brewery tanks, requiring 250 tons of plates, has been placed with a nearby fabricator, with release contingent upon favorable action on the beer bill now pending in congress. Inquiry for plates for such tanks continues to feature the market, requirements in other lines being extremely limited. Plates are steady at 1.60c, base, Pittsburgh.

Chicago—Action is deferred on pending work requiring fabricated plates, and orders from leading consumers are slow and unimproved. Railroad tonnage is particularly light, and this industry gives little promise of early resumption of buying. Better tank business is anticipated next month. Plates nominally continue 1.70c, Chicago.

Contracts Placed

5300 tons, cruiser No. 39, to Bethlehem Shipbuilding Corp., Quincy, Mass. Vessel also will require 1800 tons of other types of steel.

700 tons, eastern pipe project, to unstated fabricator.

310 tons, four tanks for Monarch Refining Co., Long Beach, Calif., to Southwest Welding Co., Los Angeles.

125 tons, tow boat, Bath Iron Works, Bath, Me., to Lukens Steel Co., Coatesville, Pa.

Contracts Pending

1200 tons, drydock caisson, navy yard, Norfolk, Va.; Dravo Contracting Co., Pittsburgh, low on general contract.

700 tons, ferry boat, Virginia Ferry Corp., Norfolk; shipyards now figuring. In addition, boat will require 300 tons of shapes and 60 tons of bars.

200 tons, four boilers for Mare Island, Calif., on specification 7119; bids postponed from Dec. 21 to Jan. 14.

Personals

(*Concluded from Page* 10)

vice president of the Associated Alloy Steel Co., Cleveland, now being disbanded, and prior to that sales manager of the development division of the Central Alloy Steel Corp., on Jan. 1 will become manager of the stainless steel department of the Sharon Steel Hoop Co., Sharon, Pa. With the exception of two years in the army during the World war, Mr. Carson has been identified with the alloy steel industry since his graduation from Ohio State university in 1913. He is a member of the American Iron and Steel institute and American Society for Steel Treating.

Railroads

Most of Santa Fe Rail Order Given Colorado Mill—Routine Inquiries Make Most Demand

TRACK MATERIAL PRICES, PAGE 35

Pittsburgh—Inquiries for miscellaneous steel products and track fastenings have been issued during the past week by several leading railroads. Most of these are merely routine inquires which cover the railroad for its requirements in bars, plates, shapes and boiler tubes principally over the coming quarter and permit them to specify at will. The Atlantic Coast line has postponed bids until Jan. 5 on 5000 kegs of spikes and the Boston & Maine is receiving bids on several thousand kegs. The New York Central railroad closes Dec. 27 on its first quarter steel needs and the Norfolk & Western closed bids late last week for its bar, plate and shape requirements, which were entered at a nominal figure of 2500 tons. The Chesapeake & Ohio will buy 1000 to 1500 tons of plates for car and other repairs. Supplementing its recently divided order of 26,484 tons of rails, the Santa Fe is now inquiring for 2500 to 3000 tons of spikes, tie plates and fastenings. While most of this business will logically be placed with western mills, Pittsburgh producers can bid on fastening needs for eastern divisions of the railroad. About 700 tons of plates for 50 steel gondolas for the Wheeling & Lake Erie have been placed with a local mill. The Edgar Thomson rail mill of the Carnegie Steel Co. finished its one week run the middle of last week and completed only two orders aside from a tonnage rolled for stock. Prices on railroad track materials remain unchanged at 2.40c on spikes and 1.75c on tie plates. Standard open-hearth rails are $40 per ton.

Boston—New England railroads are buying little steel. One inquiry is out for spikes for first half. Repair program promised by the New York, New Haven & Hartford is slow in materializing.

Cleveland—Chesapeake & Ohio is understood to be formulating its budget for steel purchases in January, but other roads with headquarters here indicate no purchasing except for routine repair material will be undertaken until March or April. Recent government loans will facilitate car repair programs, but plans have not yet matured for speeding up work. In some instances it is felt that railroad car and locomotive repair work will continue through January at about the December rate. Railroads feel keenly the loss of a larger proportion of steel shipments to trucking companies, steel being trucked as far as 200 miles in this territory. Nevertheless, the outlook for railroad business in 1933 is considered brighter.

Chicago—Releases of small lots of rails to Chicago mills will permit a continuation of recent light operations during the current week. New business is light, headed by 27,349 tons placed by the Atchison, Topeka & Santa Fe railroad with four producers. Only a small tonnage will be rolled in this district. Equipment buying continues at a standstill with no new inquiry noted, and action on pending work deferred.

The rail wage question has been disposed of until Oct. 31, 1933, following a meeting of the managers' conference committee and labor union executives here during the past week. A compromise was reached whereby the 10 per cent deduction currently in effect and scheduled to terminate Jan. 31, 1933, has been extended for nine months. After June 15, 1933, either party will be permitted to serve notice of an intended change in basic rates to become effective after Oct. 31. The agreement affects about 1,000,000 union labor employes of the railroads.

Car Orders Placed

Consolidated Railroad of Cuba, one Brill gasoline rail motor car to American Car & Foundry Export Co., New York.

Texas & Pacific, one gasoline electric rail motor car with trailer to the Edward G. Budd Mfg. Co., Philadelphia.

Locomotives Placed

Hill & Suender Inc., one geared locomotive to Heisler Locomotive Works, Erie, Pa.

J. Seerrales, Porto Rico, one locomotive to Davenport Locomotive & Mfg. Co., Davenport, Iowa.

Rail Orders Placed

Atchison, Topeka & Santa Fe, 27,349 tons; 22,605 tons to Colorado Fuel & Iron Co.; 1908 tons to Bethlehem Steel Co.; 1418 tons each to Illinois Steel Co. and Inland Steel Co.

Car Orders Pending

Missouri Pacific, conversion of seven dining cars into lounge cars, bids asked.

United Fruit Line, 60 fruit cars, 15 tons capacity, for Santa Marta railroad, Colombia, S. A.

Structural Shapes

Awards Over 75,000 Tons, Year's Second Largest, with 60,000 for New Orleans Bridge—20,000 Pending for New York Central Railroad Terminal

STRUCTURAL SHAPE PRICES, PAGE 35

New Orleans—The public belt line railroad bridge here, requiring approximately 60,000 tons of structural steel, is to be awarded Dec. 28. Contract for the main span taking 20,000 tons, will be signed with the American Bridge Co., Pittsburgh, and for the approaches, taking 40,000 tons, with the McClintic-Marshall Corp., Bethlehem, Pa. Definite contract award on the twenty-eighth will allocate this business which has been pending for some little time.

New York — Award of 3020 tons for a Newark, N. J., viaduct and 650 tons for a postoffice at Binghamton, N. Y., feature a dull yearend. Bids are in on New York state bridges, requiring 3000 tons. A large tonnage pends, mainly for public work, which may develop early next year.

Inquiries for sheet piling are unusually numerous.

Boston—Award of a 545-ton bridge at Concord, N. H., is outstanding in a quiet market. Massachusetts state highway work ahead includes bridges at Oxford, Pittsfield and Saugus River. Two jobs call for about 500 tons of steel sheet piling. The 1.60c, Pittsburgh, price on plain material frequently is shaded.

Philadelphia — Except for the naval hospital here, requiring 2300 tons, on which bids exceeded the appropriation, most of the larger federal work in this district has been placed. This, with delay on private work, is making for a dull situation in structurals. A ferry boat for the Virginia Ferry Corp., Norfolk, Va., previously noted as contemplated, will take 300 tons of shapes, in addition to 700 tons of plates and 60 tons of bars. Shapes are 1.70c, nearest mill, on carlots.

Buffalo—Information has been received here indicating the Reconstruction Finance Corp. has reopened its inquiry into the two Grand Island bridges proposal here, which had been acted upon unfavorably by the corporation's engineers. If financed the bridges will require 12,000 to 15,000 tons of shapes and reinforcing bars.

Cleveland—An award of 350 tons for a municipal powerhouse at Piqua, O., to the Fort Pitt Bridge Co., Pittsburgh, is the only important job of the week. General contractors have yet to award several fair size tonnages for state bridges; bids for additional bridges went into the state highway department Dec. 23, and others are scheduled for opening Jan. 3. Private work is extremely light.

Pittsburgh — Allegheny county commissioners were authorized last week by the federal government to construct a $3,000,000 bridge from Pittsburgh to Homestead, Pa., over the Monongahela river. A large tonnage of structural steel will be required, though plans have not been issued nor are funds forthcoming by the county. Two Pennsylvania state bridges on which bids went in Dec. 22 at Harrisburg, Pa., require 1075 tons. Plain structural material is easy at 1.50c to 1.60c on sizable jobs.

Chicago—Fabricated shape inquiry has declined to the lowest volume of the year and most pending work requires only small tonnages. Awards consist principally of miscellaneous highway bridges. Action on the proposed 50,000-ton observation tower to be built here is deferred.

Contracts Placed

60,000 tons, approximately, public belt line railroad, New Orleans; 20,000 tons for main span to American Bridge Co., Pittsburgh, and 40,000 tons for approaches to McClintic-Marshall Corp., Bethlehem, Pa. Contracts scheduled to be signed this week.

2020 tons, viaduct over Pennsylvania and Lehigh Valley railroad tracks, Newark, N. J., to Phoenix Bridge Co., Phoenixville, Pa.; J. F. Chapman & Son, Hillside, N. J., general contractors.

900 tons, bridge over Klackamas river, Oregon City, Oreg., to Poole & McGonigle Inc., Portland, Oreg.

675 tons, highway bridges, Nebraska; 340 tons, to Wisconsin Bridge & Iron Co., Milwaukee, 335 tons to Pittsburgh-Des Moines Steel Co., Pittsburgh.

650 tons, postoffice, Binghamton, N. Y., to McClintic-Marshall Corp., Bethlehem, Pa., Walbridge-Aldinger Co., Detroit, general contractor.

600 tons, steel piling, Kaw river bridge, Kansas City, Mo., to Kansas City Structural Steel Co., Kansas City, Mo.

575 tons, highway bridges, Iowa; 475 tons to McClintic-Marshall Corp., Bethlehem, Pa.; 100 tons to Rock Island Bridge & Iron Works, Rock Island, Ill.

560 tons, federal building, Reno, Nev., to Milwaukee Bridge Co., Milwaukee; MacDonald Engineering Co., Chicago, contractors.

546 tons, bridge, Port Clinton, O., to R. C. Mahon Co., Detroit; through A. Bentley & Sons Co., Toledo, O. Revised from 350 tons previously reported placed.

545 tons, bridge superstructure, and removal of old span, Concord, N. H., to Lackawanna Steel Construction Corp., Buffalo, $52,387.04 total bid. Work also includes 34 tons of reinforcing bars.

475 tons, bridge, Hendrickson, Mo., to Stupp Bros. Bridge & Iron Co., St. Louis.

350 tons, municipal powerhouse, Piqua, O., to Fort Pitt Bridge Co., Pittsburgh.

347 tons, two bridges over Pico creek, San Simeon, Calif., to Consolidated Steel Corp., Los Angeles.

270 tons, highway bridges, Randolph county, Illinois; to Vincennes Bridge Co., Vincennes, Ind.

225 tons, highway bridge, Delta borough, Pennsylvania, to American Bridge Co., Pittsburgh.

180 tons, trestle, in connection with work on south pier of Golden Gate bridge, San Francisco, to unnamed interest. General contractor is Pacific Bridge Co., San Francisco.

175 tons, bridge, Rushford, Minn., to McClintic-Marshall Corp., Bethlehem, Pa.

150 tons, state armory, Napanoch, N. Y., to Lackawanna Steel Construction Corp., Buffalo.

135 tons, highway bridge, Palmyra, Mich., to R. C. Mahon Co., Detroit.

125 tons, bridge, Bureau county, Illinois, to Clinton Bridge Works, Clinton, Iowa.

110 tons, postoffice, El Centro, Calif., to Virginia Bridge & Iron Co., Roanoke, Va.; Union Engineering Co., Huntington Park, Calif., general contractor. Blue Diamond Co., Los Angeles, awarded 50 tons of reinforcing bars.

100 tons, shapes and bars, post exchange, theater and gymnasium, Bolling Field, Washington, 75 tons of shapes to Dietrich Bros., Baltimore; 25 tons of bars to Capitol Fireproof Co., Rosslyn, Va.; Lloyd Goode Inc., Washington, contractor.

100 tons, shapes and bars, overpass, highway 2, McLennan county, Texas, to Virginia Bridge & Iron Co., Roanoke, Va., and Central Texas Iron Works, Fort Worth, Tex.; West & Womack, Fort Worth, general contractors.

100 tons, fire station, Boston, to New England Structural Co., Everett.

Awards Compared

	Tons
Awards, week ended Dec. 24	**70,663**
Awards, week ended Dec. 17	**12,174**
Awards, week ended Dec. 10	**34,597**
Awards this week in 1931	**22,760**
Av. weekly awards, 1931	**34,236**
Av. weekly awards, 1932	**17,429**
Av. weekly awards, Nov.	**11,468**
Awards to date, 1931	**1,734,743**
Awards to date, 1932	**906,347**

Mass.; M. S. Kelliher Co., Boston, general contractor.
100 tons, postoffice, Port Chester, N. Y., to Ingalls Iron Works Co., Verona, Pa.; Robert G. McKay, Yonkers, N. Y., general contractor. Concrete Steel Co., New York, awarded 65 tons of reinforcing bars.
100 tons, postoffice, Stroudsburg, Pa., to American Bridge Co., Pittsburgh.

Contracts Pending

20,000 tons, first three floors, New York Central railroad's terminal warehouse, New York. Project will eventually take 47,000 tons.
3000 tons, state highway bridges, New York; bids in.
2400 tons, hospital building, Baltimore, for the University of Maryland.
1500 tons, appraisers' store, Baltimore; Pike & Cook Co. Inc., Minneapolis, and Sinclair & Grigg, Philadelphia, low on alternate supplementary bids.
950 tons, courthouse, Fort Worth, Tex.; James I. Barnes, Springfield, O., low.
850 tons, bridge, Sawyer, Okla.
600 tons, bridge, Grand Junction, Colo.
478 tons, highway bridge, Poplar Bluff, Mo.; general contract awarded to Service Construction Co., Joplin, Mo.
435 tons, piling, bulkhead, lighthouse bureau, Chelsea, Mass.; bids in.
400 tons, bridge, Knights Landing, Calif.; bids soon.
306 tons, addition, postoffice, Jersey City, N. J.; Iovacchini Bros., Highland Park, Pa., low.
300 tons, bridge, New York Central railroad, Poughkeepsie, N. Y.
250 tons, tunnel structure for San Jacinto tunnel, Los Angeles; general contract awarded to Metropolitan Engineering Co., Los Angeles.
193 tons, highway work in Routt county, Colorado; bids Dec. 22.
184 tons, 435-foot steel truss bridge for state, Clarion and Armstrong counties, Pennsylvania; Guibert Steel Co., Pittsburgh, low at $33,163. Project includes 29 tons of plain steel bars.
150 tons, postoffice, Rochester, Minn.; G. Schwartz & Co., Rochester, Minn., low.
135 tons, addition, state school, Rome, N. Y.; bids in.
125 tons, second ventilation building at Boston end of East Boston traffic tunnel.
120 tons, bridge, United States engineer, Delaware City, Del.; Triest & Earle, Philadelphia, low on general contract.

Concrete Bars

Public Work Continues to Supply Moderate Orders—Large Total Pending for Action in Spring—Mills Make Effort to Strengthen Billet Steel Prices

REINFORCING BAR PRICES, PAGE 35

New York—Highway reinforcement and bridges call for the bulk of pending reinforcing bar tonnage, although a large part of this material will not be bought until after the holidays. Awards are light. Prices are unchanged, but steadier.

Boston—Including close to 1000 tons for a caisson core wall at Enfield, Mass., and highways and bridges, about 2000 tons are pending in New England. Billet bar prices frequently are shaded on the larger lots. Rail steel bars are steady.

Philadelphia—Buying of reinforcing bars is practically at a standstill. Several substantial tonnages are pending, but seasonal influences delay action. The bid of John McShain, this city, general contractor, low on the naval hospital here, requiring 600 or 700 bars, exceeded the appropriation. Whether a further sum will be appropriated by the government or new bids will be taken is to be determined. Billet steel in cut lengths is 1.45c to 1.55c, Pittsburgh, or 1.76c to 1.86c, Philadelphia.

Pittsburgh—Effective Dec. 21 and for the first quarter, new billet steel reinforcing bars are being sold at 1.50c, Pittsburgh, Buffalo and Cleveland, for mill stock lengths. For cut lengths 1.65c, same basing points, prevails. A higher delivered price at New York and Philadelphia also has been put in effect. Tonnage entered by local mills is light.

Chicago—Except for several large tonnages for public work, the reinforcing bar market is devoid of active projects involving more than a few tons at a time. Bar orders for Illinois and Indiana road work on which bids have been taken over the past several months are expected to be distributed shortly.

Cleveland—For a bridge at Port Clinton, O., 246 tons of concrete bars have been placed with the Pollak Steel Co., Cincinnati, which also booked several other smaller lots for bridges. Bars for the Cleveland postoffice, amounting to 115 tons, will not be purchased until January. State bridge and highway work to be awarded on bids opened Dec. 23, and of Jan. 3 will provide several hundred tons.

Awards Compared

	Tons
Awards, week ended Dec. 24	1,468
Awards, week ended Dec. 17	3,170
Awards, week ended Dec. 10	2,620
Awards, this week, 1931	3,572
Av. weekly awards, 1931	6,808
Av. weekly awards, 1931	3,952
Av. weekly awards, Nov.	2,236
Awards to date, 1931	358,092
Awards to date, 1932	205,543

Contracts Placed

327 tons, including 215 tons of mesh and 112 tons of bars, state highway No. 67, Hempstead county, Arkansas, to Truscon Steel Co., Youngstown, O.; J. B. McCrary Co., Atlanta, Ga., general contractor.
246 tons, bridge, Port Clinton, O., to Pollak Steel Co., Cincinnati; through A. Bentley & Sons Co., Toledo, O.
166 tons, bridge over Topanga creek, Santa Monica, Calif., to Blue Diamond Co., Los Angeles.
140 tons, buildings at Government Island, Calif., to Truscon Steel Co., San Francisco.
135 tons, overpass, Westchester county, New York, to Truscon Steel Co., Youngstown, O.
130 tons, highway and grade separation, Lindenhurst, L. I., to Concrete Steel Co., New York; through Thomas F. McDermott Co. Inc., New York.
124 tons, two bridges over Pico creek, San Simeon, Calif., to Truscon Steel Co., San Francisco.
100 tons, state bridge, Sullivan county, New York, to Joseph T. Ryerson & Son Inc., New York.
100 tons, zoological building, Riverside, Ill., to Calumet Steel Co., Chicago.

Contracts Pending

2250 tons, Illinois road work; bids opened Dec. 23.
1150 tons, Pine Canyon dam, Pasadena, Calif.; bids Dec. 27.
600 tons, roadwork, Indiana.
250 tons, San Jacinto tunnel structures, Los Angeles; general contract awarded to Metropolitan Engineering Co., Los Angeles.
168 tons, Panama; Republic Steel Corp., Youngstown, O., low; bids Dec. 21.
163 tons, two state bridges, San Diego county, California; bids Dec. 28.
157 tons, state highway work in Monterey county, California; bids Jan. 4.
110 tons, bars and shapes, postoffice, Duncan, Okla.; W. B. Smith, Plainview, Tex., low.
100 tons, state bridge, Owego, N. Y.

Wire Users Buy Little Until Prospects Clear

Wire Prices, Page 35

Pittsburgh—Prices on nails, wire fencing and other wire products are fairly firm in domestic competition but the market has declined over the past several weeks in point of specifications. Prices which generally prevail are $1.95 per keg on nails in car lots and 2.20c for plain wire, with woven wire fencing $55 for No. 9 to 11 gage. Several wire mills here plan to close for indefinite periods this week, although the shutdowns probably will

not go, with one exception, past the first of the year.

Worcester, Mass.—Wire orders have declined, but with the leading interest volume is ahead of the same month last year. Prices are steady and unchanged for the first quarter.

Cleveland—Contracts for first quarter for manufacturers' wire have been offered at $2 a ton under the present market of 2.20c, base, mill, but evidently have not been placed as leading producers are are holding to this figure. Demand recently has reflected orders from the automotive industry. Bolt manufacturers whose automotive business has been good have been active in specifying. Jobbers' orders are slow.

Chicago—Movement of wire products is at a low ebb, while shipments of manufacturers' wire are moderately less active than a month ago. Interest in forward requirements generally is lacking, purchases being principally for immediate needs. Little betterment in demand from jobbers in farm areas is in early prospect, although a seasonal upturn in some directions is looked for next month. First-quarter contracting is slow, the market continuing $2 for carload lots of wire nails and 2.25c for plain wire.

American Steel & Wire Co. has been awarded 250 tons of half-inch steel strand for the United States engineer, Vicksburg, Miss., at $13,406.70, delivered. Black Wire Rope Co., Peoria, Ill., was low on 200 tons of 7/16-inch strand with $10,015.40, delivered.

St. Louis—Broderick & Bascom Rope Co. has booked 63 tons of wire strand for the United States engineers at Memphis, Tenn., at 3.28c, f.o.b. contractor's mill.

Bolt, Nut, Rivet Buying Light for First Quarter

Bolt, Nut, Rivet Prices, Page 35

Pittsburgh—Buyers of bolts, nuts and rivets have entered only a few scattered specifications for January shipment. Jobbing concerns are slowest to specify and only moderate orders are coming from automobile concerns. Prices are firm and 75 off list is quoted on carriage and machine bolts, with nominal prices of 2.25c the base for large rivets.

New York—Bids will be opened early in January on caissons for underpinning for the San Francisco-Oakland bridge, with bolt and nut makers here figuring on approximately 90 tons of bolts, washers and spikes. Some releases for the automotive trade have stimulated the operations of at least one eastern maker, to around 20 per cent of capacity, at least five points above the general average for eastern bolt and nut plants. Railroads are buying little, and while most jobbers have entered contracts for next quarter, specifications are being issued slowly. Bolts are holding generally at 75 off list and rivets at 2.25c, Pittsburgh.

Cleveland—Rivet orders from eastern and middle western railroads in the past week here were larger than in any week in more than a month, evidently reflecting preparations for more extensive repair work. Demand from other general industrial lines for nuts, bolts and rivets shows the usual slackening before inventory. Prices are steady.

Chicago—Bolt, nut and rivet specifications from miscellaneous consumers are well maintained despite the absence of buying by jobbers. Sales this month for some interests are larger than a year ago.

Pipe

Federal Loan for Chicago Waterworks Develops 5000 Tons—Miscellaneous Buying Is Light

PIPE PRICES, PAGE 49

Chicago — This city has been granted a loan of $2,327,000 by the Reconstruction Finance Corp. for waterworks improvements. A new pumping station will be built to supplant three old units and will require about 5000 tons of cast pipe. Ft. Wayne, Ind., will take new bids on about 100 tons for waterworks use. Pipe sellers look for a fair accumulation of business for self-liquidating projects shortly after Jan. 1. The Chicago association of commerce will seek from the interstate commerce commission adjustments in freight rates which it is claimed place pipe producers in this district at a disadvantage in competing with Ohio and Pennsylvania manufacturers for business in western markets.

Denver is inquiring for 4000 tons of cast pipe for a water line.

Boston—Few cities have anticipated cast pipe needs for next year, Boston excepted, bids being in on 1200 tons. Several hundred tons are up for metropolitan district work at Quincy, Mass., and a Charles river basin roadway, the latter taking a 60-inch main. Prices average about $30, foundry.

New York—Cast pipe buying is light while pending business is small. Schenectady, N. Y., has placed 730 tons with the Burlington, N. J., foundry. Prices hold at $30 to $32, eastern foundry.

Philadelphia — Bids are being taken by Philadelphia on 70 tons of 8, 12, 16, and 24-inch steel water pipe, and approximately 25 tons of 12, 14, and 16-inch steel pipe, ⅜-inch wall, for piling in connection with a Pennsylvania railroad improvement on Thirtieth street. This material is being sought under contract form No. 14. Action still is pending on approximately 1500 tons of foundation pipe for the local customs house.

Pittsburgh—After having produced for stock a week ago, one pipe mill in this district has closed temporarily. Operations by other tubular products manufacturers are expected to be at a low point over this week. Demand is featureless.

Cleveland—Jobbers are arranging for replenishing stocks immediately after the inventory season. Orders from this source were the only feature of an otherwise quiet market during the week.

Birmingham, Ala.—Recent pipe orders have been filled from stocks, but preparations have been made to speed up production if demand improves after Jan. 1. Public projects in the South and West offer some prospects for better business.

Cast Pipe Placed

730 tons, 24-inch, Schenectady, N. Y., to United States Pipe & Foundry Co., Burlington, N. J.

100 tons, small sizes, Augusta, Me., to R. D. Wood & Co., Philadelphia.

Cast Pipe Pending

5000 tons, approximately, waterworks, Chicago; $2,327,000 loan granted by Reconstruction Finance Corp.

4000 tons, for water line, Denver.

610 tons, 6-inch, San Francisco; Central Foundry Co., Birmingham, Ala., low.

100 tons, various sizes, Ft. Wayne, Ind., pump station; new bids asked.

Obituaries

(*Concluded from Page* 13)

ago he was assistant secretary of the Standard Steel Car Co.

Strip

Seasonal Factors Limit Sales—Motor Needs Give Some Tonnage—Prices Hold Steady

STRIP PRICES, PAGE 35

Pittsburgh — Contrary to past years, practically no strip steel tonnage is being entered for January delivery. This lack of orders the past few weeks had generally been expected, but the fact that no business appears forthcoming for January delivery is not promising. One producer here will start two mills Dec. 27 for several days. Demand for rustless and specialty finishes of strip holds considerably better than that for carbon steel. The average of strip mill operations here last week was around 8 to 10 per cent, with indications that this week it will be even lower. Prices are reported firm, 2.00c being done on cold-rolled and 1.45c the hot-rolled strip steel base.

New York—Strip sellers look for January to bring improvement; trading at present is flat. Prices are unchanged.

Philadelphia—Hot-rolled strip is quiet at 1.45c, Pittsburgh, or 1.76c, Philadelphia, with cold-rolled at 2.00c, Pittsburgh or 2.31c, Philadelphia. Sellers look for improvement in January.

Cleveland—Strip releases from automotive interests have held up much better than expected, though new orders, especially those from partsmakers, recently have slackened. Strip 5-15/16 inches wide and 84 inches long is specified as an alternative to hot-rolled pickled sheets on 1000 tons of automobile license tag stock for which Ohio is taking bids at Columbus to Dec. 30. The market for hot-rolled strip usually is 1.45c to 1.50c, base, Pittsburgh; and cold-rolled, 1.90c to 2.00c.

Chicago—Strip selling has shown a moderate decline recently, principally as a result of seasonal factors, but fair tonnages are being received for automotive requirements. Specifications from other users are principally for immediate needs with forward buying rather light. Production continues at 10 to 15 per cent. On new business the market usually is 1.55c, Chicago, for hot strip and 2.00c, Pittsburgh-Cleveland, for cold-rolled strip.

Operations at 12 Per Cent Equal to Year's Low Point

Pittsburgh—Ingot production this week will be on the underside of 10 per cent of capacity as against 16 per cent a week ago. Plants were closed over the past weekend and many are not reopening this week. One independent had been running three open hearths and closed down late last week, while the same procedure was followed by another independent's plant. The leading interests here are closing some of their divisions entirely this week. The outlook for improvement in this rate is beclouded and not until sometime in the week of Jan. 2 is a turn upward anticipated. Eight out of 53 steelworks blast furnaces here are in blast, four are being operated by a Steel corporation subsidiary.

Operations, week ended Dec. 24	**12**
Operations, week ended Dec. 17	**14**
Operations, week ended Dec. 10	**15**
Operations, one year ago	**15-20**
High for 1932, Feb. 6	**28.5**
Low for 1932, July 9	**12**

Philadelphia—With the holidays at hand, eastern steelmaking operations have dipped to around 10 per cent, with no improvement expected until after Jan. 1.

Buffalo—A last minute revision of mill schedules was to keep three open-hearth furnaces in production here over the Christmas holiday, making an 8 per cent operating rate prevail during the holiday period.

Youngstown, O.—During the week ended Dec. 24, steel production averaged about 11 per cent, or slightly above the late August low. The unexpected resumption of the Farrel, Pa., plant of the Carnegie Steel Co. will probably prevent the rate going lower this week. Some plants are idle for inventory, but finishing departments are fairly active and a slight improvement next week is not unlikely.

Cleveland — Steel ingot production here for the week ended Dec. 24 averaged 19 per cent, down from 29 per cent in the preceding week. The reduction was due entirely to the shutdown for the holidays. Otis Steel Co., with four active units, suspended Thursday night; Corrigan, McKinney Steel Co., with three active, and American Steel & Wire Co., with two, closed Saturday afternoon. These units are scheduled to resume Dec. 27.

Chicago—Ingot production was fractionally lower at slightly below 10 per cent the past week, and is expected to vary but slightly over the holiday period. One independent mill down during the past week was expected to resume operations Monday of this week. Blast furnace activity is unchanged, with eight of 36 stacks active. Finishing mill operations are irregular, and reduced but slightly.

Birmingham, Ala.—During the first half of last week steel production was at the rate of 15 per cent, about equal to the preceding week, then it went off almost altogether. A complete cessation was scheduled for the first part of Christmas week.

Warehouse Trade Dull But Prices Not Changed

Warehouse Prices, Page 49

New York—Warehouse volume has slipped off, the usual year-end holiday slump. Prices are unchanged.

Boston—Prices on one brand of sheets have been reduced $10 a ton by a leading warehouse distributor in New England.

Philadelphia—Dullness in the local warehouse market has become more pronounced with the approach of the holidays, with jobbers awaiting the turn of the year for a pickup. Prices are unchanged.

Pittsburgh—With one exception, local jobbers report tonnage less than a month ago. There have been no changes in blue annealed and black sheet prices out of stock, which remain 3.00c and 3.15c, respectively. The only recent change in prices has been the cut in terne plate of approximately $1 per package.

Detroit—Warehouse business in iron and steel came up to the Christmas holiday on a parity with the November average of business. The decline this week is expected to be no more than seasonal. Prices are steady.

Cincinnati—Jobbers have revised sheet prices. No. 10 blue annealed, to 48-inch, is now 3.05c and 3.20c for wider. No. 24 black is 3.50c, all widths and No. 24 galvanized, 3.90c. A downtrend in demand since the middle of December has been noted.

Chicago—Additional declines are noted in sales, but demand is slightly ahead of the midsummer volume.

St. Louis—Only goods urgently and immediately needed are being taken. A few seasonal items, notably tubing and sheets, show some life.

RAW MATERIAL PRICES

Delivered pig iron prices subject to 10 per cent freight surcharge, maximum 13.44c gross ton, from Jan. 4

Asterisk denotes price change this week

Pig Iron

Per Gross Ton

FOUNDRY, NO. 2

Chicago, furnace	$15.50
Pittsburgh, dist. fur.	15.00
Pittsburgh, delivered	15.63 to 16.13
Valley furnace	14.50 to 15.00
Cleveland fur., local del.	15.00
Philadelphia, delivered	13.26 to 13.76
Virginia furnace	17.25
Granite City, Ill., fur.	16.50 to 17.50
Buffalo, fur., local del.	16.00
Buff., all-rail, Boston	18.91 to 19.91
Buff., all-rail, Brooklyn	18.90
Buff., all-rail, Newark	17.28
Ala., Bir. fur., local del.	11.00
Ala., Nor. del., Bir. base	10.00
Alabama, del. Chicago	16.01
Alabama, del. St. L.	14.42
Alabama, del. Cincinnati	13.82
Ala., Phila., dock del.	15.00 to 15.25
Ala., Balt., dock del.	15.00
Alabama, New York dock	15.50
Ala., Boston dock del.	15.75 to 16.75
Tenn., Bir. base, local del.	13.00
Tennessee, del. Cinn.	13.82
Montreal, delivered	23.00 to 23.50
Toronto, delivered	22.10

FOUNDRY, NO. 2X

Buffalo, fur., local del.	16.50
Buff., all-rail, Brooklyn	19.40
Buffalo, all-rail, Newark	17.78
Buff., all-rail, Boston	19.91 to 20.91
Virginia furnace	17.75
Eastern, del. Phila.	13.76 to 14.26

FOUNDRY, NO. 1X

Buffalo fur., local del.	17.50
Eastern, del. Phila.	14.26 to 14.76

MALLEABLE

Valley furnace	14.50 to 15.00
Cleveland fur., local del.	15.00
Pittsburgh dis. fur.	15.00
Pittsburgh, delivered	15.63 to 16.13
Chicago, furnace	15.50
Buffalo fur., local del.	16.50
Eastern Penna, delivered	14.63 to 15.91
Granite City, Ill., fur.	16.50 to 17.50
Montreal, delivered	24.00
Toronto, delivered	22.60

BASIC

Pittsburgh, district fur.	14.00
Pittsburgh, delivered	14.63 to 15.13
Eastern Penn., del.	13.50
Buffalo fur., local del.	15.50 to 16.00
Montreal, delivered	23.50
Valley, furnace	14.00

BESSEMER

Valley furnace	14.50 to 15.00
Pittsburgh, furnace	15.00
Pittsburgh, delivered	15.63 to 16.13

LOW PHOS.

Valley fur., standard	25.00
Philadelphia, standard	23.76 to 26.79
Copper-bear., E. Pa. fur.	21.50 to 23.00

GRAY FORGE

Valley furnace	14.00
Pittsburgh district fur.	15.00
Pittsburgh, delivered	15.63 to 16.13

CHARCOAL

Lake Superior, del. Chicago	23.04

SILVERY

Jackson County, O., fur. in per cents: 6—$18; 7—$18.50; 8—$18.75; 9—$19; 10—$19.50; 11—$20; 12—$20.50; 13—$21.50; 14—$22.50; 15—$23; 16—$24; 17—$25.50.

Pittsburgh and Buffalo furnace: 7 to 10—$19; 15—$21 to $23.

BESSEMER FERROSILICON

Jackson County, O., fur., in per cents: 10—$20.50; 11—$21; 12—$21.50; 13—$22.50; 14—$23.50; 15—$24; 16—$25; 17—$26.50.

Coke

Prices Per Net Ton

BEEHIVE OVENS

Connellsville furnace	$1.75 to 2.00
Connellsville foundry	2.50 to 4.25
New River foundry	6.00
Wise county foundry	4.25 to 5.00
Wise county furnace	3.50 to 4.25

BY-PRODUCT FOUNDRY

Newark, N. J., del.	8.21 to 8.81
Chicago, ovens, outside del.	7.00
Chicago, del.	7.75
New England, del.	10.00
St. Louis, del.	7.75
Birmingham, ovens	4.00
Indianapolis, del.	7.75
Ashland, Ky., ovens, Connell., basis	4.50
Portsmouth, O., ovens Connell., basis	4.50
Buffalo, ovens	7.50 to 8.00
Detroit, ovens	8.00
Philadelphia, del.	8.50

Iron Ore

LAKE SUPERIOR ORE

Gross ton, 51½%, Lower Lake Ports

Old range bessemer	$4.80
Mesabi bessemer	4.65
Old range nonbessemer	4.65
Mesabi nonbessemer	4.50
High phosphorus	4.40

EASTERN LOCAL ORES

Cents per unit delivered at Eastern Pennsylvania New Jersey furnaces (Nominal)

Foundry and basic, 56-63%, contract	7.50
Copper-free low phos. 58-65%	nom.

FOREIGN ORE

Cents per units, alongside docks Atlantic ports (Nominal)

Foreign manganiferous ore, 45-55% iron, 6-10% man.	8.50 to 9.00
North African low phos.	7.50 to 8.50
Swedish basic, 65%	7.50 to 8.00
Swedish low phos.	9.00
Spanish, North African basic, 50 to 60%	7.00 to 8.00
Newfoundland fdy., 55%	8.00
Tungsten, spot, short ton unit, duty paid	$ 9.75 to 10.00
Chrome ore, 48% gross ton c.i.f.	$17.00 to 18.00

Manganese Ore

(Nominal)

Prices, not including duty, are cents per unit; cargo lots.

Caucasian, 52-55%	nominal
*South African, 52%	18 to 19 cents
South African, 49-51%	19 to 20 cents
South African, 44-47%	18 to 19 cents
Indian, 48-50%	20 cents
Brazilian, 46-48%	18 cents

Refractories

FIRE CLAY BRICK

Per 1000 f.o.b. Works

First Quality

Pennsylvania, Ohio, Illinois, Kentucky, Maryland, Georgia, Alabama	$35.00
Missouri	30.00

Second Quality

Pennsylvania, Ohio, Illinois, Kentucky, Missouri, Maryland	25.00 to 30.00
Georgia, Alabama	30.00

SILICA BRICK

Pennsylvania	$35.00
Joliet and East Chicago	47.00
Birmingham, Ala.	50.00

MAGNESITE BRICK

Per Net Ton

Burned, 9 x 4½ x 2½	$61.50
Unburned, 9 x 4½ x 2½	52.00

CHROME BRICK

Per Net Ton

F.o.b. shipping point	$42.50

MAGNESITE

Dead burned grain, net ton, Chester, Pa., or Baltimore bases	38.00
Domes, Chewelah, Wash., base	20.90

Semifinished Steel

Prices Per Gross Ton

BILLETS AND BLOOMS

4 x 4-inch base

Pittsburgh, open-hearth	$26.00
Pittsburgh, bessemer	26.00
Youngstown	26.00
Cleveland	26.00
Philadelphia	31.75
Chicago	26.00
Forging, Chicago	31.00
Forging, Pittsburgh	31.00
Forging, Philadelphia	35.75

SHEET BARS

Pittsburgh	26.00
Youngstown	26.00
Cleveland	26.00
Chicago	28.00

SLABS

Pittsburgh	26.00
Youngstown	26.00
Cleveland	26.00

WIRE RODS

Pittsburgh, Cleveland	$37.00
Chicago	38.00

SKELP

All grades, Pittsburgh	1.50c to 1.60c

Ferroalloys

(In dollars, except Ferrochrome)

Ferromanganese, 78-82%, tidewater, duty paid	$68.00
Ferromanganese, del. Pittsburgh	73.24
Spiegeleisen, 19-20%, domestic fur. spot†	24.00
*Ferrosilicon, 50 per cent, freight all., c. l.	74.50
Do, less carload	82.50
Do, 75 per cent	120.00 to 130.00
*Silicomang., 2½% carb.	85.00
2% carbon	90.00
1% carbon	100.00
(The above for spot carlots. Contract price $5 a ton less).	
*Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. con. del.	9.50
Do, for spot delivery	10.00
*Ferrotungsten, stand., lb. cont.	0.94 to 1.00
*Ferrovanadium, 35 to 40 per cent, per lb. contained, on analysis	2.60 to 2.80
Ferrotitanium, c.l., prod. plant, frt. allow., net ton	137.50
Spot, 1 ton, frt., all., lb.	8.50
Do, under 1 ton	9.00
Ferrophosphorus, per ton, carload 17-19 per cent, Rockdale, Tenn., basis; 18%, $2 unitage	50.00
Ferrophosphorus, electrolytic per ton carload, 23-26% f.o.b. Anniston, Ala.; 24%, $2.75 unitage	65.00
Ferromolybdenum, stand. 50-60 per cent. per lb.	0.95
Cal. Molybdate, lb. cont.	0.80
Molybdate, lb. cont.	0.80

†Carloads. Differentials apply to quant.

Fluorspar

85 and 5 per cent grade

Washed gravel, f.o.b. Ill., Ky., net ton car loads	$12.00
Washed gravel, import duty paid tide, gross ton	18.50

Pig Iron

Larger Buying Believed in Early Prospect—Inquiry for Basic Develops at Pittsburgh

PIG IRON PRICES, PAGE 42

Pittsburgh—Featuring an otherwise dull pig iron market was the recent inquiry from the Edgewater Steel Co., Oakmont, Pa., for 1000 to 8000 tons of basic. It was believed the order would amount to about 5000 tons. Several additional foundries have closed and foundry iron is probably moving at the slowest rate of the year. Prices continue nominal at $15 for foundry, malleable and bessemer. The Neville Island furnace is the only merchant stack in this or the valley districts operating at present.

Boston—Melters are not anticipating early 1933 requirements. Prices are irregular. The New England furnace is holding to a minimum of $16, base, furnace, but other domestic sellers are shading, though still unable to meet the low price at which Dutch iron is offered.

New York—Little pig iron is outstanding on old contracts, and consumers have little on hand. Hence, sellers believe the situation is well set for a pick-up in buying. Some local foundries have closed for the holidays. It is reported the General Fire Extinguisher Co., Providence, R. I., has postponed action temporarily on 500 tons of foundry iron for Providence, and 700 tons of malleable for Columbia, Pa. Buffalo iron is easy at $14, furnace; and eastern Pennsylvania at $12.50 to $13, furnace.

Philadelphia—Pig iron sellers will enter the new year with little carryover on existing contracts, with few exceptions. Consumers stocks are low and improved activity is expected shortly. Prices are unchanged, with eastern Pennsylvania foundry iron $12.50 to $13, base, furnace. Most silicon differentials are not more than 25 cents, and in some instances are waived entirely. Southern iron, is moving at $15 to $15.25, delivered local docks. Basic iron is nominal at $13.50, delivered, eastern Pennsylvania.

Buffalo—Consumers are awaiting the passing of the holidays before making further commitments. Prices are firm in the Buffalo district, but subject to severe competition in the East.

Cleveland—Sales during the week, though still at a low level, picked up slightly, local furnaces having booked more iron than in recent weeks, mainly for shipment to outside districts. The volume of sales was approximately 2000 tons. Not much additional buying is expected until January. A lake furnace interest supplying a considerable share of the automotive requirements closes the month with shipments at practically the same level as those in November; other makers report December shipments 10 to 15 per cent under November. The nominal market for local delivery is $15, base, furnace, on carloads; in outside competitive territory prices are easier.

Cincinnati—A Dayton, O., buyer has closed for 1000 tons of northern iron during the past week. Other sales are light. Inquiries are limited to carload lots.

Chicago—Pig iron shipments have reversed the downward trend prevailing over the past several weeks and the total December movement will show a smaller decrease than anticipated. January will show a fairly substantial upturn in shipments, according to present indications, and for some sellers next month's business is expected to equal that of October which was the peak month of the fall period. Prices are steady at $15.50, furnace, for No. 2 foundry and malleable. Occasional sales of charcoal iron are noted at $23.04, delivered, although this market is untested.

St. Louis—Pig iron consumption in this district is close to the lowest level reached during the depression. Indications point to a marked reduction in December shipments below the November total. Broader purchasing is expected immediately after the first of the year.

Birmingham, Ala.—According to reports here, no pig iron has been sold for delivery in the first quarter, unusual for this time of the year. Sales for immediate shipment have been limited to a few carloads. Consumers have reduced stocks to the lowest point possible.

Toronto, Ont.—Interest in the pig iron market has dropped to the lowest point of the year. Blast furnace representatives report sales for the week totaled less than 200 tons. No inquiries have appeared for first quarter.

Coke

Beehive Prices Exhibit Easier Trend—Foundry Demands at Chicago Gain in December

COKE PRICES, PAGE 42

Pittsburgh—Beehive and by-product foundry coke scarcely moves but the quiet state of trade has resulted in far from a stable price situation. Standard beehive foundry is obtainable as low as $2.25, though some is bringing $2.50. Furnace coke is quiet following the specifying of a fair order by a light company recently. This grade may be obtained at around $1.75. Premium grades of foundry bring $4 to $4.25. Coke for domestic heating purposes is in demand, one blast furnace near here having moved 70,000 tons this fall.

New York—With some foundries in this district down for the remainder of the year and others operating at little over 12 or 15 per cent, coke specifications have dropped to about the lowest point of the year. No change in prices is reported.

Chicago—December marks the sixth consecutive month that shipments of by-product foundry coke have increased. Gains are small and consumers are not anticipating future requirements. Foundry coke continues $7, ovens, for outside delivery and $7.75, delivered Chicago.

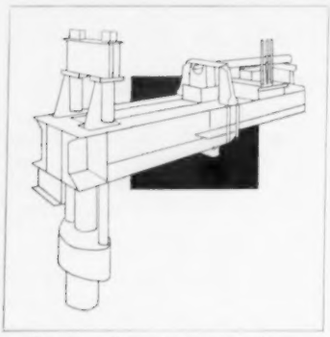
Cincinnati—The movement of by-product foundry coke has slowed, but demand for domestic grades continues heavy. Prices are steady.

St. Louis — Orders and specifications for metallurgical coke during the week fell to the lowest point of the year, but demand for heating coke was the most active in three years, being stimulated by prolonged and severe cold weather in districts served by oven interests here. Prices are unchanged.

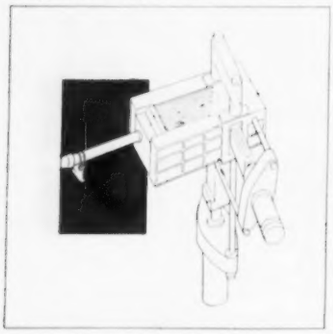
Birmingham, Ala.—Prospects for coke business in the first half are considered encouraging, as shipments evidently wil be continued to outside districts where southern coke recently has been tried. Better reports also are at hand regarding foundry requirements soon after the turn of the year. Coke production will not be greatly reduced during the holiday period.

LOGEMANN

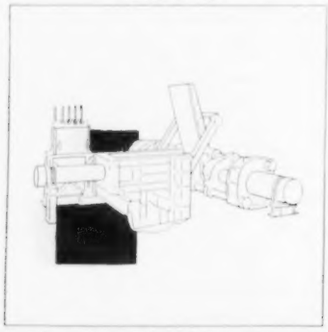
A Full Line



Ejection Type Standard Press



Three Ram Press for bulky scrap



Three Ram Hinged Cover Press for Drums, Etc.

Whether your scrap accumulation warrants a hand press—a car baler—or equipment in between—there is a Logemann press for the job. Fast working—efficient—Logemann balers answer every scrap metal need. They meet any installation requirement. And—they fill the bill of low cost operating demands.

To bale scrap metal is an obvious saving. To bale it with a Logemann press makes this fact doubly certain. Fool proof mechanical features and long life construction offer an indisputable evidence of achievement. It is written indelibly in the profit records of industrial users. A Logemann press is an investment that pays.

Logemann engineers will be glad to prove this fact in your plant. Ask them.

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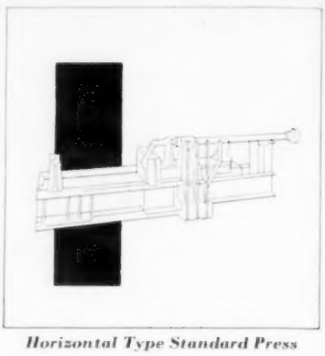
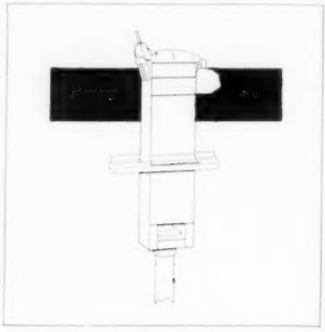
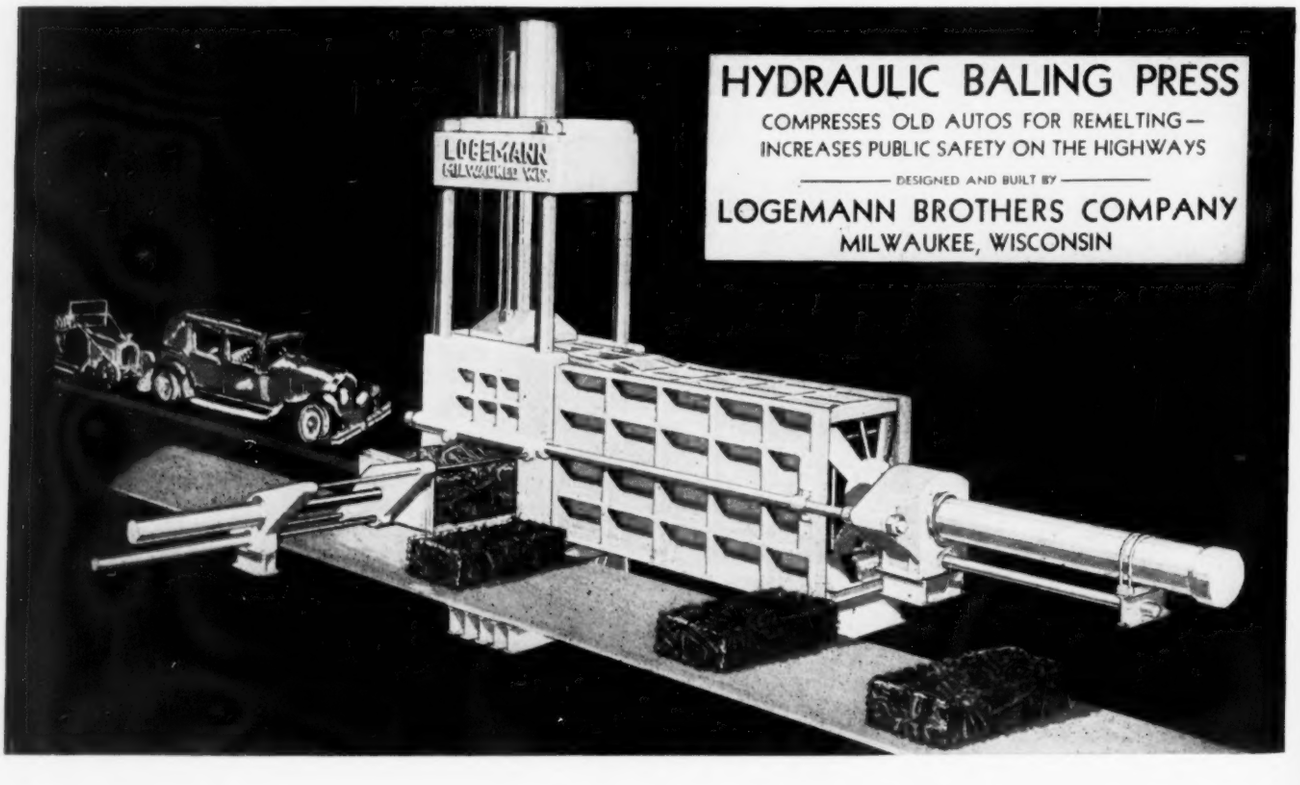


Horizontal Type Standard Press



Single Ram Press-- usually for cans

Mechanical Type Press



Scrap

Lull in Demand Marks Close of Year—Prices Nominal, Little Change Being Made in Level

Chicago—Poor activity in the scrap market reflects low operations among principal consumers and lack of interest in commitments for future requirements. New buying of heavy melting steel is lacking, with the market nominally continuing $5 to $5.50. Shipments of this grade are at a low ebb. Offerings of distress tonnages are light and no surplus of cheap scrap is available. Cast grades are easier.

Boston—Additional grades of steel and iron scrap have weakened and quotations are lower. Demand is practically absent except for some scrap being bought for water shipment. Local demand is dull.

New York—Scrap buying continues dull with few mills taking shipments. Prices on some grades are

IRON AND STEEL SCRAP PRICES

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL

Birmingham	7.50 to 8.00
Boston, dealers	2.75 to 3.25
Buffalo, No. 1	7.00 to 7.50
Buffalo, No. 2	6.00 to 6.50
Chicago	5.00 to 5.50
Cleve., No. 1	7.00 to 7.50
Cleve., No. 2	6.00 to 6.50
Det., No. 1 deal.	4.50 to 5.00
Det., No. 2 deal.	3.00 to 3.50
E. Pa. del. mill	6.50
E. Pa., No. 2 del.	5.00 to 5.50
N. Y. deal. R. R.	4.00 to 4.50
N. Y. deal. No. 2	3.00
N. Y. deal. yd.	2.50 to 3.00
Pitts. No. 1	8.25 to 8.75
St. L. No. 1 sel.	5.50 to 6.00
Federal, Ill.	4.75 to 5.25
Granite City, Ill.	5.00 to 5.50
Valleys, No. 1	8.50 to 9.00

COMPRESSED SHEETS

Buffalo, dealers	6.00 to 6.50
Chi. (Factory)	3.75 to 4.25
Cleveland	6.50 to 7.00
Detroit, dealers	4.00 to 4.50
E. Pa. new mat.	5.00 to 5.50
Pittsburgh	8.00 to 8.50
Valleys	8.25 to 8.75

BUNDLED SHEETS

Buffalo	4.00 to 4.50
Cinci., del.	4.25 to 4.75
Cleveland	4.50 to 5.00
Eastern, Pa.	5.00
Pittsburgh	7.00 to 7.50
St. Louis	1.50 to 2.00

SHEET CLIPPINGS LOOSE

Chicago	2.00 to 2.50
Cincinnati	2.00 to 2.50
Detroit, dealers	1.25 to 1.75
St. Louis	1.50 to 2.00

STEEL RAILS SHORT

Birmingham	8.50 to 9.00
Boston, dealers	2.75 to 3.00
Buffalo	9.50 to 10.00
Chicago (3 ft.)	7.50 to 8.00
Chicago (2 ft.)	8.00 to 8.50
Cinci., del.	9.00 to 9.50
Detroit, deal.	8.00 to 8.50
Pitts. (open-hearth, 3 ft. and less)	10.50 to 11.00
St. Louis	7.00 to 7.50

STOVE PLATE

Birmingham	5.00 to 5.50
Boston, dealers	2.00 to 2.50
Buffalo	7.50 to 8.00
Chicago, net	4.50 to 5.00
Cinci., deal. net	3.50 to 4.00
Det., net deal.	2.50 to 3.00
Eastern Pa.	6.00 to 6.50
N. Y., deal. mill	2.50 to 3.00
St. Louis	5.50 to 6.00

COUPLERS, SPRINGS

Buffalo	9.00 to 9.50
Chicago	6.50 to 7.00
Eastern Pa.	8.50
Pittsburgh	8.75 to 9.25
St. Louis	5.25 to 6.25

ANGLE BARS—STEEL

Chicago	7.00 to 7.50
St. Louis	5.75 to 6.25

LOW PHOSPHORUS

Buffalo, billets and bloom crops	9.00 to 9.50
Cleveland bil. and bloom crops	10.00 to 11.00
Eastern Pa.	8.50
Pittsburgh billet bloom crops	10.50 to 11.00
Pitts., sheet bar crops	10.50 to 11.00

FROGS, SWITCHES

Chicago	5.50 to 6.00
St. Louis	5.00 to 5.50

SHOVELING STEEL

Chicago	5.00 to 5.50
Cleveland	5.75 to 6.00
St. Louis	4.75 to 5.25

RAILROAD WROUGHT

Birmingham	7.50 to 8.00
Boston, dealers	1.00 to 1.50
Buffalo, No. 1	4.50 to 5.00
Buffalo, No. 2	7.00 to 7.50
Cinci., No. 2	5.00 to 5.50
Chi., No. 1, net	4.50 to 5.00
Chicago, No. 2	5.50 to 6.00
Eastern Pa.	6.50
N. Y., No. 1, deal.	2.50 to 3.00
Pitts., No. 2	8.25 to 8.75
St. Louis, No. 1	3.50 to 4.00
St. Louis	4.75 to 5.25

SPECIFICATION PIPE

Boston	3.00 to 4.00
Eastern Pa.	7.00 to 7.50
N. Y., deal	2.00 to 2.25

BUSHELING

Buffalo, No. 1	6.00 to 6.50
Chicago, No. 1	3.75 to 4.25
Cinn., No. 1 dl.	4.00 to 4.50
Cinn., No. 2	2.50 to 3.00
Cleve., No. 2	3.00 to 3.50
Det., No. 1 new deal.	3.25 to 3.75
St. L., No. 1	3.00 to 3.50
Val. new No. 1	8.75

MACHINE TURNINGS

Birmingham	2.50 to 3.00
Boston, dealers	0.75 to 1.00
Buffalo	3.75 to 4.25
Chicago	3.00 to 3.50
Cin., deal.	3.00 to 3.50
Cleveland	4.50 to 5.00
Detroit	1.25 to 1.75
Eastern Pa.	3.00 to 3.50
N. Y., deal	1.35 to 1.50
Pittsburgh	6.00 to 6.50
St. Louis	1.50 to 2.00
Valleys	6.50 to 7.00

BORINGS AND TURNINGS

For Blast Furnace Use

Boston, dealers	.75 to .90
Buffalo	3.75 to 4.00
Cinn., deal.	3.00 to 3.50
Cleveland	4.50 to 5.00
Detroit, deal	1.75 to 2.25
Eastern Pa.	3.50 to 3.75
N. Y., deal.	1.35 to 1.50
Pittsburgh	5.50 to 6.00

CAST IRON BORINGS

Birming., chem.	12.00 to 13.00
Birming., plain	2.50 to 3.00
Boston, chem.	5.50 to 6.00
Boston, dealers	1.00 to 1.25
Buffalo	4.25 to 4.50
Chicago	3.25 to 3.75
Cinn., deal.	3.00 to 3.50
Cleveland	4.50 to 5.00
Detroit, deal.	1.75 to 2.25
Eastern Pa.	3.50 to 3.75
E. Pa., chem.	8.00 to 10.50
N. Y., deal.	1.00 to 1.50
Pittsburgh	5.50 to 6.00
St. Louis	2.00 to 2.50

PIPE AND FLUES

Cinn., deal.	3.25 to 3.50

RAILROAD GRATE BARS

Buffalo	4.00 to 4.50
Chicago, net	5.00 to 5.50
Cincinnati	4.00 to 4.50
Eastern Pa.	5.50 to 6.00
N. Y., deal.	3.50 to 4.00
St. Louis	4.50 to 5.00

FORGE FLASHINGS

Boston, dealers	2.00 to 2.50
Buffalo	5.50 to 6.00
Cleve. ov. 10 in.	6.00 to 6.50
Detroit	2.75 to 3.25

FORGE SCRAP

Boston, dealers	1.75 to 2.00
Chicago	6.50 to 7.00
Eastern Pa., del.	5.00 to 5.50

ARCH BARS, TRANSOMS

Chicago, net	5.00 to 5.50
St. Louis	3.50 to 4.00

AXLE TURNINGS

Boston, deal.	2.50 to 3.00
Buffalo	6.25 to 6.75
Chi., elec. fce.	4.50 to 5.00
Cleveland	5.50 to 6.00
Eastern Pa., del.	7.00
Pittsburgh, O. H.	7.00 to 7.50
St. Louis	3.00 to 3.50

STEEL CAR AXLES

Birmingham	9.00 to 9.50
Boston, ship. pt.	6.00 to 6.50
Buffalo	10.00 to 10.50
Chicago, net	8.50 to 9.00
Eastern Pa.	14.50
St. Louis	8.75 to 9.25

SHAFTING

Boston, ship. pt.	6.50 to 7.00
N. Y., deal.	6.50 to 7.00
St. Louis	7.50 to 8.00
E. Penna.	11.00 to 12.00

CAR WHEELS

Birming., iron	7.00 to 7.50
Boston, iron deal.	3.25 to 3.50
Buffalo, iron	7.00 to 8.00
Buffalo, steel	8.50 to 9.00
Chicago, iron	7.00 to 7.50
Chi., rolled steel	7.00 to 7.50
Cincinnati iron	6.25 to 6.75
E. Pa. steel	8.50 to 9.00
E. Pa. iron	8.50
Pitts., iron	7.75 to 8.25
Pitts., steel	8.75 to 9.25
St. Louis, iron	4.75 to 5.25
St. Louis, steel	6.00 to 6.50

NO. 1 CAST SCRAP

Birmingham	8.00 to 8.50
Buffalo (Mach.)	9.75 to 10.25
Buffalo, cupola	9.00 to 9.50
Boston, textile	6.75 to 7.00
Boston No. 2	2.25 to 2.50
Chi., mach. net	5.50 to 6.00
Chi., railroad, net	5.00 to 5.50
Chicago, agri., net	5.00 to 5.50
Cinn., mach. cup.	7.00 to 7.50
Cleve. cupola	7.00 to 8.00
Det., net deal.	6.50 to 7.00
E. Pa. cupola	9.00 to 9.50
N. Y., cup. deal.	5.00 to 5.50
N. Y., del. local foundries	8.00 to 8.50
Pitts., cupola	8.50 to 9.00
San Fran., del.	13.50 to 14.00
Seattle	4.50 to 6.50
St. L. No. 1 ma.	6.00 to 6.50
St. L. No. 1	5.50 to 6.00

HEAVY CAST

Boston, del.	3.25 to 3.50
Bost., mach. cast	7.00 to 7.50
Buffalo, break.	6.50 to 7.00
Cleve., break	5.50 to 6.00
Detroit, auto, net deal.	7.00 to 7.50
Det., break., dl.	4.00 to 4.50
Eastern Pa.	8.50
N. Y. No. 1, dl.	5.00 to 5.50
N. Y. break, dl.	4.50 to 5.00
Pittsburgh	8.00 to 8.50

MALLEABLE

Boston, consum.	7.50 to 8.00
Buffalo	8.00 to 8.50
Chicago, agri.	5.00 to 5.50
Chicago, R. R.	6.00 to 6.50
Cinci., R. R., del.	6.50 to 7.00
Cinci., agri. del.	6.00 to 6.50
Cleveland, rail	7.50 to 8.00
Det. auto deal.	5.00 to 5.50
St. Louis	7.00 to 7.50

RAILS FOR ROLLING

5 feet and over

Birmingham	8.00 to 9.00
Boston, deal.	5.00 to 5.50
Buffalo	7.00 to 7.50
Chicago	8.00 to 8.50
Eastern Pa.	9.50
New York dealer	4.25 to 4.75
St. Louis	7.00 to 7.50

LOCOMOTIVE TIRES

Chicago, cut	7.00 to 7.50
St. L., No. 1	5.00 to 5.50

LOW PHOS. PUNCHINGS

Chicago	7.50 to 8.00
Buffalo	9.00 to 9.50
Eastern Pa.	8.50
Pittsburgh	10.50 to 11.00

nominal due to lack of business. No. 1 melting steel for barge loading is unchanged at $4 to $4.50 and No. 2 holds at $3, barge. Cast scrap is easier.

Philadelphia—Award of an additional 1000 tons of No. 1 heavy melting steel by Bethlehem Steel Co. for its Johnstown, Pa., plant at $8 to $8.50, delivered, depending upon freight rates, is the only sizable scrap tonnage reported here and even this has no direct bearing upon the local market. The prices done on the Johnstown tonnage were the same as those paid for 3500 to 4000 tons for that point a fortnight or so ago. Prices throughout the list are nominally unchanged, with sellers anticipating some improvement after Jan. 1.

Buffalo—Demand for steel and iron scrap is at the usual pre-holiday vanishing point. Dealers believe there will be tonnage purchased by two or more district melters very shortly. Meantime the market is purely nominal and nothing is moving to consumers.

Pittsburgh—Only heavy breakable cast and machine shop turnings are moving in this market, both to the Brackenridge, Pa., consuming point. The leading interest here failed to purchase scrap during the week and buying at the earliest probably will be deferred until the latter part of this week when orders may be issued for January shipment. No. 1 heavy melting steel continues quoted at $8.25 to $8.75, although no orders are reported in the district. The same dull state continues in hydraulic compressed and specialty items.

Cleveland—Scrap movement is at a minimum, foundries taking almost no cast grades and little steel moving to open hearths. Prices are largely nominal and recent lower quotations at nearby centers have not had an effect here in the absence of trading. Indications point to renewed buying after the New Year.

Detroit—Nominal prices on steel and iron scrap are unchanged, though weak. Expectation of returning strength early in the year aids the situation. Holiday interruptions tend to hold the market quiet for the next few days.

Cincinnati—Lessened demand for iron and steel scrap was disclosed by lower bids on recent railroad lists. For some items prices were unacceptable to the roads which withheld this material. Quotations are nominally unchanged.

St. Louis—Activities in iron and steel scrap have reached the low point of the year. Shipments against contracts are light and the only railroad offering was 4600 tons by the Chicago, Burlington & Quincy. Proffers from other sources are practically absent. The east side steel mill, which recently acquired a round tonnage of heavy melting steel and steel specialties, has intimated that it will make an additional purchase at a reduction of 25 cents per ton below former transaction.

Birmingham, Ala.—Little steel and iron scrap is moving and quotations are nominal, except that No. 1 cast retains firmness that appeared recently. Heavy melting steel is in small demand.

Toronto, Ont.—The iron and steel scrap markets are in a state of stagnation. There is little resale demand for scrap and dealers are not interested in adding to already overstocked holdings. Mills are out of the market and there is no movement in heavy melting steel and turnings. Even the demand that long prevailed for special iron grades has disappeared, and melters are buying only for actual needs.

Iron Ore Stocks Sufficient for Years

Iron Ore Prices, Page 42

Cleveland—Stocks of iron ore at Lake Superior mines, lower lake ports and furnaces are estimated by producers as sufficient for three years' furnace operations at the November rate. Though port and furnace stocks Dec. 1 were lower than a year ago, they probably will be considerably above normal April 1, keeping down shipments in 1933. The Lake Superior Iron Ore association's current report:

	Tons
Consumed in October	735,010
Consumed in November	696,331
Decrease in November	38,679
Consumed in November, 1931	1,311,212
On hand at furnaces Dec. 1, 1932	26,892,609
On Lake Erie docks, Dec. 1, 1932	5,191,114
Total at furnaces and Lake Erie docks Dec. 1, 1932	32,083,723
Total Dec. 1, 1931	39,232,150

The association also reports that the vessel shipments in 1932, amounting to 3,532,306, were of the following grades: Nonbessemer, 2,065,541 tons: bessemer, 1,257,925 tons; silicious, 106,137 tons; and manganiferous, 102,703 tons.

The revised simplified practice recommendation on wheelbarrows is now available from the superintendent of documents, government printing office, Washington, for 5 cents a copy.

Prices Are Reduced on Certain Ferroalloys

Ferroalloy Prices, Page 42

Reductions in certain ferroalloy prices have been announced by leading sellers. Silicon briquets in ton lots have been cut from $90 a ton to $87, Niagara Falls, N. Y., freight allowed. On less than ton lots, 4.00c a pound is asked. The contract price on ferrosilicon, 50 per cent grade, has been reduced $3 a gross ton to $74.50 in carlots, bulk, while ton lots are quoted $82; and for spot delivery, $5 higher on both.

The contract price on 75 per cent ferrosilicon in carlots has been reduced to $120 a gross ton, bulk, and in ton lots to $130, with spot delivery quoted $10 higher on each price, freight allowed.

Ferrochrome is quoted 9.50c a pound contained on carload contracts covering 66 to 70 per cent material, 4 to 6 per cent carbon. Ton lots on spot delivery now are 10.00c a pound, against a previous price of 10.50c on 60 to 70 per cent grades. Less than ton lots now are held at 10.25c a pound.

On 67 to 72 per cent chromium with a maximum of 2 per cent carbon, 16.50c has been named on contracts for spot delivery; on a maximum of 0.10 per cent carbon, 19.50c on contracts; on a maximum of 0.20 per cent carbon, 18.50c on contracts; and on a maximum of 2 per cent carbon, 16.50c has been named on contracts, freight allowed in all instances. On all low carbon materials in containers, an additional ½-cent is being asked.

The new price scale on chrome briquets in carlots and on contracts is 7.25c a pound, in ton lots 7.75c a pound, and in less than ton lots, spot, 8.00c, Niagara Falls, freight allowed. Ferrotungsten prices have been lowered to 94.00c to $1 a pound contained, refinery, from the previous levels of $1 to $1.10 a pound.

Silicomanganese of 2½ per cent carbon is being quoted $85 a gross ton in carlots on contract. Silicon zirconium of 35 to 40 per cent zirconium is being quoted at 13.00c a pound of alloy in carloads, and ferrovanadium of 35 to 40 per cent at $2.60 to $2.80 a pound contained, freight allowed. Alsifer is being quoted 8.50c a pound in carlots on contract, f.o.b. Niagara Falls.

Ferromanganese, spiegeleisen, silicospiegel, ferrophosphorus, tungsten powder, ferrotitanium, and manganese briquets are unchanged.

Pacific Coast

Year Closes with Fair Volume Of Business Placed or Pending —Private Projects Scarce and Public Work Continues to Make Most of Demand—Prices Hold At Steady Level, but Nominal

San Francisco—(*By Air Mail*)—Despite approach of holidays and inventory period, a fair volume of business was reported placed and several new inquiries of size have come out. Of special importance is the inquiry for 1150 tons of reinforcing bars for the Pine Canyon dam, Pasadena, Calif., bids on which will be opened Dec. 27. Prices remain unchanged.

Awards of reinforcing bars aggregated 795 tons. Truscon Steel Co. took 140 tons for buildings at Government Island, Calif., and 124 tons for two bridges at San Simeon, Calif. The Blue Diamond Co. booked 166 tons for a bridge at Santa Monica, Calif. Bids have been opened on 121 tons for highway work in San Joaquin county, California and bids open Dec. 28 and Jan. 4, respectively, for highway work in Monterey County, California, involving 157 tons, and for two bridges in San Diego county, requiring 163 tons.

Only one plate award was reported. The Southwest Welding Co. secured 310 tons for four tanks for the Monarch Refining Co., Long Beach, Calif. Bids have been opened on 100 tons for a standpipe for Hamilton Field, Calif. The opening of bids on 200 tons for four boilers for Mare Island, Calif., has been postponed from Dec. 21 to Jan. 14.

Consolidated Steel Corp. took 347 tons of shapes for two bridges over Pico creek at San Simeon, Calif., and the Virginia Bridge & Iron Co. booked 110 tons for a postoffice at El Centro, Calif. Unnamed interests booked 180 tons for an 1100-foot trestle in connection with the south pier of the Golden Gate bridge, the general contract for which went to the Pacific Bridge Co. Bids open Dec. 22 for 163 tons for highway work in Routt county, Colorado.

Pipe Line up for Bids

Seattle—While private construction is absent, public works projects are being expedited in the Pacific Northwest. Some fair sized tonnages are involved.

Local interest this week centered on opening of bids for eight miles or 5800 tons of large diameter pipe for a Seattle water system extension. Figures for cast iron, steel, concrete, wood stave and combination were submitted, all being below engineers' estimates. Award may be made next week. It may go wood stave. Seattle has also called for bids Jan. 11 for improvement of the waterfront, involving sea wall and water pipe. Materials required include 5690 tons of sheet steel piling and a large quantity of cast iron pipe.

Wholesale jobbers report business extremely slack, holidays and inventories accentuating general conditions. Prices are steady despite lack of volume.

Aside from the 5800 tons of material for the Seattle pipe project, which local dealers hope to book, there is little inquiry for cast iron pipe. Snohomish, Wash., opened bids Dec. 20 for 80 tons of 4, 6 and 8-inch pipe.

It is reported that contractors for the jetty extension at Yaquima Bay, Oreg., have purchased 300 tons of relaying rails from Portland dealers. Second hand rails are offering in quantity but demand is small.

Steel in Europe

Year-end Situation Better Than at End of 1931

London—(*By Radio*)—Usual seasonal quiet is noticeable in the steel and iron trade but the outlook is decidedly better than it was a year ago. Competition from steelmakers on the Continent is unmistakably on the decrease, with resulting gains in employment, particularly in South Wales. Australia, the Argentine and Russia are buying and export trade is better. Home industries in Great Britain are reorganizing and the concentration process is gradually materializing.

The Continent reports business recession, with markets generally heavy. Germany reports its makers cannot compete with British sheetmakers.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Dec. 22

Export Prices f.o.b. Ship at Port of Dispatch—By Cable (or Radio)

	British gross tons U. K. ports		Continental Channel or North Sea ports, metric tons Gold parity, $4.8665	
PIG IRON		£ s d		£ s d
Foundry, 2.50-3.00 Silicon	$ 9.74	2 18 6	$8.27	1 14 0
Basic bessemer	8.99	2 14 0*	6.81	1 8 0
Hematite, Phos. .03-.05	9.82	2 19 0	.....	.....
SEMIFINISHED STEEL				
Billets	$16.23	4 17 6	$9.98	2 1 0
Wire rods, No. 5 gage	24.98	7 10 0	21.90	4 10 0
FINISHED STEEL				
Standard rails	$25.81	7 15 0	$26.77	5 10 0
Merchant bars	.93c	6 5 0	.58c	2 13 0
Structural shapes	1.10c	7 7 6	.47c	2 2 6
Plates, †¼ in. or 5 mm	1.30c	8 15 0	.67c	3 1 0
Sheets, black, 24 gage or 0.5 mm.	1.23c	8 5 0	1.29c	5 17 6
Sheets, gal., 24 gage, corr.	1.49c	10 0 0	1.65c	7 10 0
Bands and strips	1.15c	7 15 0	.77c to .80c	3 10 0 to 3 12 6
Plain wire, base	1.41c	9 10 0	1.18c	5 7 6
Galvanized wire, base	1.71c	11 10 0	1.38c to 1.40c	6 5 6 to 6 7 6
Wire nails, base	1.64c	11 0 0	1.21c	5 10 0
Tin plate, box 108 lbs.	$ 2.66	0 16 0	$3.20	0 13 2

British ferromanganese $68 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d ($43.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

		£ s d		French Francs		Belgian Francs		Reich Marks
Fdy. pig iron, Si. 2.5	$ 9.74	2 18 6	$ 8.00	205(2)	$ 8.31	300	$15.01	63
Basic bessemer pig iron	8.99	2 14 0*	6.63	170(1)	7.48	270	16.56	69.50
Furnace coke	2.00	0 12 0	4.84	124	3.05	110	4.58	19.20
Billets	16.65	5 0 0	14.43	370	10.94	395	23.00	96.50
Standard rails	1.23c	8 5 0	1.25c	697	1.50c	1,150	1.37c	127
Merchant bars	1.01c	6 15 0	.95c	530	.70c	540	1.19c	110
Structural shapes	1.30c	8 15 0	.99c	550	.65c	500	1.16c	107.50
Plates, †¼-in. or 5 mm	1.34c	9 0 0	1.17c	650	.78c	600	1.37c	127
Sheets, black	1.38c	9 5 0§	1.44c	800‡	.91c	700‡	1.56c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm	1.68c	11 5 0	2.83c	1,570	1.87c	1,440	4.00c	370
Plain wire	1.41c	9 10 0	2.03c	1,130	1.69c	1,300	1.92c	178
Bands and strips	1.41c	9 10 0	.99c	550	.88c	675	1.37c	127

*Basic. †British ship-plates, Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price.
British quotations are for basic open-hearth steel. Continental usually for basic-bessemer steel.

Nonferrous Mill Products

Base price cents per pound f.o.b. mill except otherwise specified. Copper and brass product prices based on 6.25c, Conn., for copper

SHEETS	
Yellow brass (high)	12.50
Copper, hot rolled	15.37½
Lead sheets, cut, to jobbers	7.00
Zinc sheets (100-lb. base)	9.00
TUBES AND PIPES	
Seamless yellow brass (high)	15.25
Seamless copper	14.37½
RODS	
Yellow brass (high, full turning)	10.25
Naval brass	11.37½
ANODES	
Copper, untrimmed	12.25
WIRE	
Yellow brass (high)	12.50

Old Metals

Dealers' buying prices, cents lb.

	No. 1 Composition	Red Brass
New York	2.62½ to	2.75
Chicago	2.12½ to	2.25
Cleveland	2.25 to	2.50
St. Louis		2.25
HEAVY YELLOW BRASS		
New York	1.87½ to	2.00
HEAVY COPPER AND WIRE		
New York	3.50 to	3.75
Chicago, No. 1	3.00 to	3.12½
Cleveland	2.50 to	2.75
St. Louis		2.50
COMPOSITION BRASS BORINGS		
New York	2.37½ to	2.50
YELLOW BRASS TUBING		
Cleveland	1.50 to	1.75
LIGHT COPPER		
New York	2.62½ to	2.75
Chicago	2.12½ to	2.25
Cleveland	2.00 to	2.25
St. Louis		2.25
LIGHT BRASS		
Chicago	1.12½ to	1.25
Cleveland	1.00 to	1.25
St. Louis		1.25
LEAD		
New York	2.00 to	2.25
Cleveland	1.50 to	2.00
St. Louis		2.00
ZINC		
New York	1.12½ to	1.25
Cleveland	1.00 to	1.12½
St. Louis		1.25
ALUMINUM		
Clippings, new, soft, Cleve.	9.50 to	10.00
Clippings, hard, Cleveland	6.50 to	7.00
Borings, Cleveland	3.00 to	3.50
Mixed cast, Cleveland	4.00 to	5.00
Mixed cast, St. Louis	4.00 to	4.25

Secondary Metals

Remelt aluminum No. 12	8.00 to	9.00
Brass ingot, 85-5-5-5		5.50

Metals

Little Fluctuation Shown in Prices—Copper Firms Up but Is Still Selling at 5.00c

New York—Little fluctuations developed in metal prices last week. Copper firmed up but still was available at 5.00c, Connecticut. Zinc and lead were steady. Tin fluctuated only slightly. Demand for all classifications was slight, dullness being accentuated by seasonal influences.

Copper—Increased buying and higher prices abroad had a sentimental affect on the domestic market. Some custom smelters were reluctant to take business at 5.00c, Connecticut, for delivery through first quarter of 1933 and at 5.12½c for second quarter. These quotations continue to rule, however. Mine producers remain out of the market at the entirely nominal quotation of 6.25c. Lake copper sellers quoted prime metal at 5.12½c, delivered Midwest. Foreign copper prices advanced more than ¼-cent over the preceding week. This was reported due to insufficient coverage by some consumers and also to speculative buying, based on the belief that foreign producers may yet come to some agreement on curtailment of output.

Lead—Corroders were the most active lead buyers last week. Ordering in the aggregate, however, has been relatively light with prompt and early January delivery specified.

Zinc—Buying interest generally was lacking with business done confined to scattered carlots for prompt shipment. Prime western metal held through the week at 3.12½c, East St. Louis, and 3.37½c, New York. No pressure to make sales was apparent. The market has been given support by the continued curtailment of ore production in the Tri-State which has been outstanding in the metal trade.

Tin—Little buying of tin was reported during the week, which resulted in a nominal price level. Strength in sterling exchange contributed to market firmness with little price change reported from day-to-day.

Antimony—Prices were untested due to lack of business.

Aluminum—Little activity was reported but prices were firm. The automotive trade continued the best taker of remelt grades.

Silver—Prices again touched the record lows of early December. The quotation Friday was 24.87½c an ounce.

Toluol More Active

New York—Spot business in distillates is light, although some consumers are covering for 1933. The lacquer trade is taking toluol in slightly better volume. Prices are unchanged and steady. Phenol is dull. More contracting is being done on naphthalene, most business being at 4.75c for flakes and balls.

Coke By-Products

Per Gallon, Producers' Plants, Tank Lots

	Spot
Pure benzol	$0.20
90 per cent benzol	0.20
Toluol	0.30
Solvent naphtha	0.26
Commercial xylol	0.26

Per Pound at Producers' Plants in 250-Pound Drums

Phenol	0.153 to 0.173

Per Pound at Producers' Plants

Naphthalene flakes	4.75 to 5.75
Naphthalene balls	4.75 to 5.75

Per 100 Pounds Atlantic Seaboard

Sulphate of ammonia	$1.10

Quicksilver Steady

New York—Quicksilver prices are unchanged, but consumers are not interested in new purchases at this time. A little is reported to have changed hands at prevailing quotations of $49, a virgin flask of 76 pounds on small lots for prompt delivery, and $48 a flask on round lots.

Nonferrous Metal Prices of the Week, Cents a Pound

Spot unless otherwise specified

	Copper			Straits Tin		Lead	Lead	Zinc	Aluminum	Antimony	Ingot
	Electro., del. Conn.	Lake, del. Midwest	Casting refinery	New York Spot	New York Futures	N. Y.	East St. L.	St. L.	98-99% Spot.	N. Y.	Nickel
Dec. 17	5.00	5.12½	4.75	22.80	23.00	3.00	2.87½	3.12½	22.90	5.40	35.00
Dec. 19	5.00	5.12½	4.75	22.85	23.05	3.00	2.87½	3.12½	22.90	5.40	35.00
Dec. 20	5.00	5.12½	4.75	22.85	23.05	3.00	2.87½	3.12½	22.90	5.40	35.00
Dec. 21	5.00	5.12½	4.75	22.85	23.05	3.00	2.87½	3.12½	22.90	5.40	35.00
Dec. 22	5.00	5.12½	4.75	22.80	23.00	3.00	2.87½	3.12½	22.90	5.40	35.00
Dec. 23	5.00	5.12½	4.75	22.80	23.00	3.00	2.87½	3.12½	22.90	5.40	35.00

STEEL, WROUGHT AND CAST IRON PIPE, AND TUBING

Base $200 net ton, except on standard commercial seamless boiler tubes under 2 inches and cold drawn seamless tubing.

Welded Iron, Steel Pipe □

Base discounts on steel pipe, Pittsburgh and Lorain, O., to consumers in carloads, Indiana Harbor, Ind., and Evanston, Ill., 2 points less. Chicago delivered, 2½ points less. Wrought pipe, Pittsburgh base.

BUTT WELD

Steel In.	Blk.	Gal.	Iron In.	Blk.	Gal.
¼ & ⅜	57	34	½	28	10½
½	62	49½	¾	33	16½
¾	65½	55	1—1¼	36	20½
1—3	67½	57	2	38	21

LAP WELD

2	61	50½	2	26	12½
2½ to 6	64½	54	2½—3½	33	18½
8	62	51	4—6	35	22
10	60	49	7—8	34	21½
12	59	48	9—12	31	16½

BUTT WELD

Extra strong, plain ends

⅛	48	33	¼ & ⅜	+7	+41
¼ & ⅜	53½	38½	½	28	12½
½	59	49½	¾	33	17½
¾	63½	54	1—2	39	23

LAP WELD

Extra strong, plain ends

2	59	49½	2	34	18½
2½ to 4	62½	53	2½—4	39	25
5 & 6	62	52½	4½—6	38	24
8	58	47	7 & 8	36	22
10	51½	40½	9—12	26	13½
12	50½	39½			

STEEL LINE PIPE

2 to 3 butt	66½	2½ to 6 lap	63½
2 lap	60	8 lap	61
10 lap	59	12 lap	58

Discounts on steel pipe are net and not subject to any point or preferential. On iron pipe, the discounts shown on

BOILER TUBES

Carload discounts, Lap Welded Steel		*f.o.b. Pittsburgh Charcoal Iron*	
2—2¼	38	1¾	8
2½—2¾	46	2—2¼	13
3	52	2½—2¾	16
3¼—3¾	54	3	17
4	57	3¾—3½	18
4½—6	46	4	20
1½	1	4½	21

On lots of a carload or more, above base discounts subject to preferential of two 5 per cent discounts on steel and 10 per cent on charcoal iron.

Lap Welded Steel—Under 10,000 pounds, 6 points under base and one 5 per cent; on 10,000 pounds to carload, 4 points under base and two 5 per cents. Quantity discounts same as for hot rolled, in next column. Charcoal Iron—under 10,000 pounds, 2 points under base; on 10,000 pounds to carload, base and one 5%.

STANDARD COMMERCIAL SEAMLESS BOILER TUBES COLD DRAWN

1 inch	61	3	46
1¼—1½	53	3¼—3½	48
1¾	37	4	51
2—2¼	32	4½, 5, 6	40
2½—2¾	40		

HOT ROLLED

2—2¼	38	3¼—3½	54
2½—2¾	46	4	57
3	52	4½ 5, 6	46

Quantity discounts are: Under 10,000 pounds, 10 points and 5 per cent; 10,000 to 24,999 pounds, 6 points and 5 per cent; 25,000 pounds to carload, 2 points and 5 and 5 per cent; carload and over, base discount and 5 and 5 per cent. No extra for lengths up to and including 24 feet. Sizes smaller than 1 inch and lighter than standard gage to be held at mechanical tubes list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Tubing □ □

Cold drawn; f.o.b. mill discounts

Random lengths over 5 ft. 55%
Selected lengths, 1—18 ft. 53%

Cast Iron Water Pipe □ □

Class B Pipe—Per Net Ton

Six-inch and over, Bir. ....$32.00 to 33.00
Four-inch, Birmingham .... 35.00 to 36.00
Four-inch, Chicago ..... 43.40 to 44.40
Six to 24-inch, Chicago..... 40.40 to 41.40
Six-inch and over, N. Y... 32.00 to 34.50
Four-inch, New York ..... 34.50 to 36.50
Stand. fittings, Bir. base.... $90.00

Six to 24-inch, base; over 24-inch plus $20; 4-inch, plus $10; 3-inch plus $20; gas pipe fittings, $5 higher. Class A pipe $3 higher than Class B.

Warehouse Quotations at Leading Centers, in Cents Per Pound

(All Philadelphia prices subject to quantity differentials except reinforcing and Swedish bars)

STEEL BARS

Baltimore*	2.35c
Boston††	2.90c
Buffalo	2.95c
Chattanooga	3.00c
Chicago	2.75c
Cincinnati	3.00c
Cleveland	2.75c
Detroit	2.85c
Houston	2.65c
Los. Ang.	3.30c
New York‡(d)	3.10c
Philadelphia	2.45c
Pittsburgh	2.60c
Portland	3.35c
San Fran.	3.15c
Seattle	3.00c
St. Louis	3.00c
St. Paul	3.00c
Tulsa	3.25c

IRON BARS

Baltimore	2.35c
Boston††	3.10c
Buffalo	3.15c
Chattanooga	3.00c
Chicago	2.75c
Cincinnati	3.00c
Detroit	2.85c
New York‡(d)	3.10c
Philadelphia	2.45c
St. Louis	3.00c
Tulsa	3.25c

REINFORC. BARS

Baltimore	2.35c-3.00c
Boston	3.10c-3.25c
Buffalo	2.95c
Chattanooga	3.00c
Cincinnati	3.00c
Cleveland	2.10c-2.25c
Detroit	2.85c
Houston	3.00c
Los. Ang. cl.	2.10c
Los Ang., lcl	2.40c
New York	2.65c-3.10c
Phila.	2.62½c
Pittsburgh	2.60c
San Fran. cl.	2.40c
San Fran. lcl	2.80c
Seattle	3.00c
St Louis	3.15c
Tulsa	3.25c
Young.	2.30c-2.60c

SHAPES

Baltimore*	2.35c
Boston††	3.00c
Buffalo	3.20c
Chattanooga	3.20c
Chicago	3.00c
Cincinnati	3.25c
Cleveland	2.95c
Detroit	3.10c
Houston	3.25c
Los. Ang.	3.30c
New York(d)	3.10c
Philadelphia	2.45c
Pittsburgh	2.85c
Portland	3.35c
San Fran.	3.15c
Seattle	3.00c
St. Louis	3.25c
St. Paul	3.25c
Tulsa	3.50c

PLATES

Baltimore*	2.35c
Boston††	3.00c
Buffalo	3.20c
Chattanooga	3.20c
Chicago	3.00c
Cincinnati	3.25c
Cleveland, ¼-in. and thicker	2.95c
Clev., 3/16-in.	3.20c
Detroit	3.10c
Det., 3/16-in.	3.10c
Houston	3.00c
Los Angeles	3.30c
New York(d)	3.30c
Philadelphia	2.45c
Phila. floor	5.10c
Pittsburgh	2.85c
Portland	3.35c
San Fran.	3.15c
Seattle	3.00c
St. Louis	3.25c
St. Paul	3.25c
Tulsa	3.50c

NO. 10 BLUE

Baltimore*	2.80c
Boston††	2.90c-3.00c
Buffalo	3.45c
Chattanooga	3.50c
Chicago	2.75c-2.90c
Cincinnati	3.05c
Cleveland	3.00c
Detroit	2.90c-3.05c
Houston	3.35c
Los Ang.	3.60c
N. Y.	3.00c
Portland	4.00c
Phila.*† (e)	2.90c
Pitts.**	3.00c
San Fran.	3.50c
Seattle	4.00c
St. Louis	3.00c-3.15c
St. Paul	3.45c
Tulsa	3.70c

NO. 24 BLACK

Balt.*†	3.50c
Boston††	3.85c
Buffalo	3.70c
Chattanooga	3.65c
Chicago	3.45c
Cincinnati	3.50c
Cleveland	3.25c
Detroit	3.50c
Los Ang.	4.20c
New York	3.75c-4.00c
Phila.*†(e)	3.40c
Pitts.**	3.40c
Portland	4.50c
San Fran.	3.90c
Seattle	4.50c
St. Louis	3.70c
St. Paul	3.695c
Tulsa	4.75c

NO. 24 GAL. SHEETS

Balt.*†	4.00c
Boston††	4.00c
Buffalo	4.05c
Chattanooga	3.95c
Chicago	3.50c-3.75c
Cincinnati	3.90c
Cleveland	3.75c
Detroit	3.75c
Houston	4.25c
Los. Ang.	4.50c
New York	4.00c-4.10c
Phila.*†(e)	3.75c
Pitts.**	3.90c
Portland	5.00c
San. Fran.	4.55c
Seattle	5.00c
St. Louis	4.00c
St. Paul	4.19c
Tulsa	5.10c

†BANDS

Baltimore	2.65c
Boston††	3.40c
Buffalo	3.30c
Chattanooga	3.20c
Chicago	2.95c
Cincinnati	3.20c
Cleveland	3.00c
Det. 3/16-in. & lighter	3.15c
Houston	3.65c
Los Ang.	3.80c
New York(d)	3.30c
Philadelphia	2.75c
Pittsburgh	2.95c
Portland	3.85c
San Fran.	3.15c
Seattle	3.50c
St. Paul	3.20c
Tulsa	3.45c

†HOOPS

Baltimore	2.65c
Boston	4.90c
Buffalo	3.95c
Chicago	3.50c
Cincinnati	3.75c
Det. No. 14 & lighter	3.30c
New York	3.30c
Philadelphia	3.00c
Pittsburgh	3.60c
Seattle	5.00c
St. Paul	3.75c

†New extras apply.

COLD FIN. STEEL

Rounds & Hexagons

Baltimore (c)*	3.48c
Boston	3.60c
Buffalo	3.00c
Chattanooga*	3.65c
Chicago	3.00c
Cincinnati	3.32c
Cleveland	2.95c
Detroit	3.15c
Los Ang. (a)	4.25c
New York	3.39c
Philadelphia*	3.35c
Pittsburgh	2.95c
Portland (a)	4.50c
San Fran. (d)(f)	5.55c
Seattle (a)	4.50c
St. Paul (a)	3.20c
St. Louis	3.36c
Tulsa	4.65c

Flats and squares 50c extra, except Tulsa, where 5.14c is quoted.

COLD ROLL. STRIP

Boston 0.100 in., 500 lb. lots	5.20c
Buffalo	5.25c
Chicago (b)	5.65c
Cincinnati	5.80c
Cleve. (b)	5.55c
Detroit	5.40c
Phila. (c)	4.55c
New York	4.55c

(a) Rounds, hex, only.
(b) Net base straightening, cutting, boxing 1 ton or more.
(c) Plus mill, size and quantity extras.
(d) Minus quant. diff.
(e) New mill classif.
(f) Rounds only.
‡Domestic bars.
*Plus quan. extras.
**Less than 25 sheets
*†50 or more bundles.

Equipment

Look For More Buying To Develop After Turn of Year

Pittsburgh—In addition to previously pledged sums for plant rehabilitation, the National Committee on Industrial Rehabilitation made public last week the plans of four Pittsburgh concerns to spend over $2,000,000 on plant equipment. Leading among these is one for the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., calling for $1,260,000 in improvements and Dravo Contracting Co., Neville Island, Pittsburgh, $285,000 for improvement purchases. The large amount of pending machinery and equipment does not cast discouragement in the market at present.

Equipment sellers are finding that in spurts single pieces of machinery or other items will be released after having been figured by them in some cases over a year previously. An example of this was in the case of one manufacturing concern here which recently bought several pieces of equipment some 14 months after inquiry was first issued. Only part of a $20,000 rehabilitation pledge by the Standard Stoker Co., as mentioned in STEEL, Dec. 19, will be used for purchases at this time. Several interests find inquiries and orders for repair parts in fair activity. Several Pittsburgh steel plants are reported studying extension of electrification in furnaces and other units.

Chicago—Despite general quietness in the market for machinery and equipment, occasional sales are noted and inquiry remains fairly active. Sellers hope for the closing on a fair portion of work now pending after the first of the year. Harnischfeger Corp., Milwaukee, has received an order from the navy for 32 portable arc welders, the largest single order for this type of equipment placed in a number of months. Railroads continue to buy only equipment urgently needed, which holds true for the majority of other industries. Inquiry for power shovels is reported the best in several months.

Worcester, Mass. — Several New England machinery builders have booked substantial orders recently, sharing in the heavy business placed by Japanese buyers and additional orders placed by the navy department. A Worcester grinding machine builder booked a fair list of grinding tools for Japan while a group of small turret lathes went to a Providence, R. I. shop. Except for the two above mentioned sources there has been little improvement in demand. Recent awards by the navy have been made to the Heald Machine Co., Brown & Sharpe Mfg. Co. and the Jones & Lamson Machine Co.

New York—Outside of continued business with Japan and an increase in government shop inquiry, demand for machinery is light. Bids go in Jan. 4 on more than a dozen tools for the navy, while prices were taken this week on a list for the Portsmouth, N. H., navy yard. Private industry is buying few tools while railroads are generally out of the market for equipment.

Cleveland—The last few days of a flat-tire year find little active business in the machinery and equipment markets, but prospects for early January are unusually bright, according to one interest. Orders for $30,000 worth of machine tools, mostly of the used variety, have been placed by a manufacturer of brewing equipment here. Further purchases of this nature are anticipated when legislative developments on beer legalization crystallize further.

November Hoist Orders Up

New York—Members of the Electric Hoist Manufacturers' association report the number of hoists ordered during November increased 12.307 per cent as compared with the previous month, and the value of such orders increased 4.991 per cent as compared with October. Shipments were 0.4908 per cent greater in November than they were in October.

Crane Bookings Increase

New York—Shipments and new orders gained slightly in November, according to the Electric Overhead Crane institute, although unfilled orders were lower on Dec. 1.

Shipments included 10 units with a tonnage capacity of 67, valued at $43,289. This compares with five cranes shipped in October with a tonnage capacity of 105, valued at $42,032.

New orders taken in November covered nine cranes with a tonnage capacity of 198, valued at $36,480. The previous month six cranes were booked, tonnage capacity 80, valued at $30,555.

Unfilled orders Dec. 1 called for 17 cranes, tonnage capacity 985, valued at $209,355. On Nov. 1 unfilled orders included 23 units, tonnage capacity 920, valued at $222,181.

Here and There In Industry

(Concluded from Page 13)

W. A. Rogers; vice presidents, F. W. Anderson and Charles Burghart; treasurer, D. B. Cassell; secretary, L. D. Sinclair.

□ □ □

Cramer Machinery Co. has been organized by Charles F. Cramer, with offices at 706 Lewis building, Portland, Oreg. The company will act as distributing agency for manufacturers of building and construction equipment.

□ □ □

Gordon Iron Works, Tweed, Ont., was damaged by fire Dec. 16 with loss to building and equipment of $100,000. Officials have no intention of rebuilding at present, but may salvage some equipment and ship it to the Hamilton, Ont., plant.

Foreign Trade Declines in November; Balance Is Lower

Washington—Both imports and exports decreased in November compared with the same month of last year, according to the department of commerce.

November exports were valued at $139,000,000 lowest in 30 years, compared with $193,540,000 for last November, while imports totaled $104,000,000, against $149,480,000 for November of last year. In November the excess of exports over imports was $35,000,000 a year ago it was $44,060,000.

Stainless Barrels for Beer

Tentative inquiries for materials, prompted by the possibility of a return of beer, frequently refer to a probable new market for stainless steel. Reports from Germany show that in 1930 the production of stainless steel barrels for the brewing industry totaled 14,453 units, compared with 15,235 in 1929, 12,001 in 1928, 9466 in 1927, 5588 in 1926 and 1164 in 1925.

Construction and Enterprise

CONCISE, TIMELY BUSINESS BUILDING OPPORTUNITIES IN FIELD OF INDUSTRY

New York

ALBANY, N. Y.—New York Power & Light Co., 126 State street, Albany, is having plans prepared for a gas plant at North Greenbush, N. Y., to cost about $28,000.

BROOKLYN, N. Y.—Electrolier Corp. has been incorporated with 100 shares no par value to manufacture lighting fixtures, by M. Ehrlich, 150 Nassau street, New York.

BUFFALO—Witteman Co. has been incorporated with 200 shares no par value to manufacture beverage-making machinery, by Rann, Vaughan, Brown & Sturtevant, Buffalo, N. Y.

HORSEHEADS, N. Y.—Horseheads Foundry Corp. has leased the plant of the Reeves Foundry Co., here, and will manufacture valves and meter boxes, starting operations early in 1933. W. J. Gibney, former president of the Chemung Foundry Corp. Chemung, N. Y., is head of the new company.

MIDDLETOWN, N. Y.—Monroe Eliminator Co. has been incorporated with $50,000 capital to manufacture electrical equipment, by A. C. N. Thompson, Middletown, N. Y.

NEW YORK—Lock-Me-Tight has been incorporated with $20,000 capital to manufacture window fastenings, by F. T. Kleiger, 270 Broadway, New York.

NEW YORK—Clayton Co. has been incorporated with 100 shares no par value to manufacture metal and glass products, by G. C. Allen, 345 Madison avenue, New York.

NEW YORK—Don Russeau has been incorporated with $12,000 capital to manufacture iron railings and allied products, by C. Kimball, 475 Fifth avenue, New York.

NEW YORK—Ango Wood Specialties has been incorporated with $20,000 capital to manufacture metal and paper products, by H. Wollitzer, Jackson Heights, New York.

NEW YORK—Pelham Hoisting Co. has been incorporated with 200 shares no par value to manufacture cranes and hoists, by Simpson, Thatcher & Bartlett, 120 Broadway, New York.

NEW YORK—Ottergis Machine Works has been incorporated with $20,000 capital to manufacture tools and metal products, by J. E. Dyross, 405 Lexington avenue, New York.

NEW YORK—Rubenstein Steam Appliances has been incorporated with $1000 capital to manufacture tools and machinery, by H. L. Greene, 220 Broadway, New York.

NEW YORK—Standard Fuse Panel Co. has been incorporated with $20,000 capital to manufacture switch boxes for electrical installations, by N. Gross, 305 Broadway, New York.

NEW YORK—Board of water supply, 346 Broadway, has plans for steel frame corrugated steel covered open chambers, service gate and crane equipment for Hillview reservoir at Sixty-fifth street, to cost $25,000.

NIAGARA FALLS, N. Y.—Isco Chemical Co., C. C. Wickstead in charge, 117 Liberty street, has let a general contract for a boiler house and power plant to the Kennedy & Van Saun Mfg. & Engineering Corp., 2 Park avenue, New York, to cost about $50,000. (Noted Dec. 19).

New Jersey

NEWARK, N. J.—United Electrical Mfg. Co. has been incorporated with 2500 shares no par value to manufacture electrical appliances, by Joseph J. Corn, 790 Broad street, Newark, N. J.

NEWARK, N. J.—Air Conditioning Corp. of Bergen County has been incorporated with $25,000 capital and 100 shares no par value to manufacture electrical equipment, by Green & Green, Newark, N. J.

SUSSEX, N. J.—Jutting Airwing Corp. has been incorporated with $100,000 capital to manufacture airplanes, by Hommell & Hommell, Sussex, N. J.

Pennsylvania

CORAOPOLIS, PA.—Bids are being taken by the city until Jan. 17 for a 180-horsepower diesel engine for the municipal pumping station.

PHILADELPHIA—Philadelphia Electric Co., 1000 Chestnut street, has appropriated $10,530,000 in its budget for building an electric and power distribution equipment in 1933.

PHILADELPHIA — American Commercial Alcohol Corp., Delaware avenue and Tasker street, will build a 2-story manufacturing building at that address, to cost about $200,000.

PITTSBURGH — Cosgrove-Meehan Coal Corp. will spend about $500,000 on rolling stock, power plant and other improvements. Buckeye Coal Co. plans to spend $125,000 for modernizing its coal-handling equipment.

PITTSBURGH—John F. Casey Co.,

EMPIRE STEEL SHEETS

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All Grades
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COLD ROLLED
•
HOT ROLLED PICKLED
•
HOT ROLLED ANNEALED
•
TIN MILL BLACK
All Grades
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PHOENIX CHILL ROLLS
PHOENIX SAND ROLLS

PITTSBURGH ROLLS
CORPORATION
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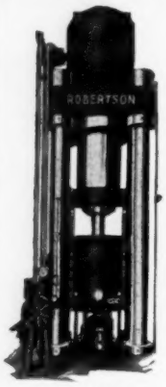
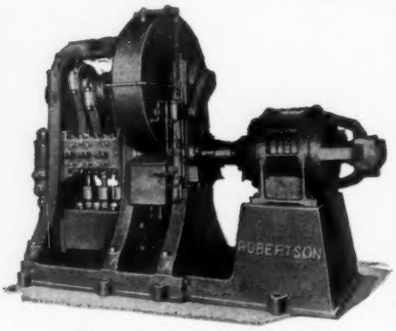
Internationally used *and* Liked



Lead Cable Encasing Press



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Perforating Co.
Rochester New York

Pittsburgh, has been awarded a contract to build an upper guide wall extension at lock No. 4, Allegheny river, Natrone, Pa., on a bid of $45,895.

TYRONE, PA.—Fire destroyed the plant of the James C. Stine Co., Tyrone, with loss set at $200,000. Company operated a gray iron and brass foundry but had not been in operation for several months.

Ohio

CLEVELAND—Cleveland Equipment Works, 1175 East 152nd street, has let a contract for a plant addition to the A. M. Higley Co., 2036 East Twenty-second street, estimated to cost about $28,000.

CLEVELAND — Oilswell Machine Corp. has been incorporated with $25,000 capital to manufacture machinery, by C. F. & G. N. Shaver, Public Square building, Cleveland.

GRAFTON, O.—W. O. Larson Foundry Co. will begin operations Jan. 1 of a large modern foundry at Grafton, purchased from the Osborn Mfg. Co., Cleveland. It will do a jobbing business and headquarters will be at Cleveland.

TOLEDO, O.—City Machine & Tool Co., Toledo Factories building, has let a contract for a plant addition to cost about $30,000 to the H. J. Spieker Co., 1418 Elm street.

TOLEDO, O.—Defiance Spark Plugs Inc., Raymond P. Lipe president, has formed Defiance Spark Plugs Ltd., with plant at Windsor, Ont., in charge of Burton A. Maddock, to manufacture for Canadian and British Empire trade.

Michigan

ADRIAN, MICH.—City council has authorized engineers to make a survey in preparation for building a municipal electric light and power plant.

ALPENA, MICH.—Rivers and harbors committee of the house of representatives has approved tentatively an appropriation of $94,000 for improvement of Alpena harbor.

CHESANING, MICH.—Big Rock Foundry Co. has been formed with Louis Bila president, Bert Coke vice president and Allen Swartzmiller secretary-treasurer. A warehouse 36 x 40 feet is being built for tool and grinding rooms and machine shop and a new cupola is to be added. Plow points form the production of the foundry.

DETROIT—True Alloys Inc. has been incorporated with $20,000 capital to manufacture nonferrous metals, by Fred P. Rheinfrank, 1945 Gladstone avenue, Detroit.

DETROIT—Rich Tool Co. and Rich Steel Products Co. have been incorporated by the Wilcox-Rich Corp., 9771 French road, each with 100 shares no par value, to deal in steel products, tools and machines.

DETROIT—Kettlewell Co., 3429 East Jefferson avenue, has been incorporated with $100,000 capital to manufacture special machinery, by Richard Kettlewell, 19220 Kingston drive, Detroit.

DETROIT—Bids will be received by United States engineers at Detroit until Jan. 6 for dredging 1,717,400 cubic yards from the ship channel in the upper end of Lake St. Clair and 1,984,000 cubic yards from the channel at the lower end of the lake.

EAST GRAND RAPIDS, MICH.—City council is considering advisability of establishing a municipal electric light and power plant.

ELK RAPIDS, MICH.—Plans are being prepared for a pumping station, including an electrically-operated centrifugal pump and equipment and a storage reservoir, to cost about $10,000. Francis Engineering Co., Saginaw, Mich., is engineer.

GRAND RAPIDS, MICH.—Grand Rapids Metalcraft Corp., in receivership, may be reorganized under a plan recently proposed to stockholders. Formation of a new company is planned.

MIDLAND, MICH. — Dow Chemical Co. has plans for a 1 and 2-story plant 100 x 120 feet, to cost $35,000.

MONROE, MICH.—City of Monroe has paid its first installment of $10,000 to the United States government on the cost of the Monroe port project. Newton Steel Co., Consolidated Paper Co. and River Raisin Paper Co. also share in the expense, half of which will be borne by the government. Contracts for the improvement are to be let in January.

OWOSSO, MICH. — Recommendation has been made by citizens to the Owosso city commission for construction of an electrically operated waterworks plant, including a water softening process and also construction of a sewage disposal plant, both to be financed by the Reconstruction Finance Corp.

SOUTH HAVEN, MICH.—South Haven Terminal Co. plans erection of a terminal warehouse to cost $30,000.

WYANDOTTE, MICH.—Froelich & Emery, engineers, Toledo, are completing plans for a power plant at Wyandotte, estimated to cost $100,000, to be erected by the municipal service commission. Bids will be asked in January.

Indiana

BRAZIL, IND.—Wood Turret Machine Co. plant, owned by R. F. Sodaker, has been destroyed by fire. It was unoccupied.

Illinois

BELLEVILLE, ILL. — Survey has been completed by Pearse, Greeley & Hanson, 6 North Michigan avenue, Chicago, on possibilities of a municipal electric light and power plant to cost $1,500,000 and waterworks to cost $750,000.

CHICAGO—Forge Mfg. Co., room 838, 11 South LaSalle street, has been incorporated with 300 shares no par value to manufacture metal products, by Lewis & Titzell, 11 South LaSalle street, Chicago.

CHICAGO — Wentworth Plumbing & Heating Supply Co. has been incorporated with $10,000 capital to manufacture machinery, by Samuel & Frank, 9 South Dearborn street, Chicago.

CHICAGO—Central Die Casting & Mfg. Co. Inc., 2935 West Forty-seventh street, has been incorporated with 600 shares no par value to manufacture products of steel, iron, zinc, nickel and other metals and alloys, by Winston, Strawn & Shaw, First National Bank building, Chicago.

Southern States

PUGET SOUND NAVY YARD, WASH.—Bids will be opened by the navy department Jan. 4 for furnishing a gasoline-electric driven 10-ton traveling gantry crane for the local yard.

WASHINGTON—Bureau of supplies and accounts, navy department, will open bids Jan. 4 as follows: Schedule 9297, one motor-driven universal tool and cutter grinder for Portsmouth, N. H.; schedule 9298, one locomotive-type fire-tube boiler, for Lakehurst, N. J.; until Jan. 10, schedule 9336, one motor-driven cut-off machine; schedule 9338, one motor-driven universal cutter and tool grinder.

JACKSONVILLE, FLA. — Southern Engineering & Management plans a gas plant and distribution system in Melbourne and Eau Gallie, Fla., estimated to cost $40,000.

PENSACOLA, FLA.—Bids are due Dec. 28 by the bureau of yards and docks, navy department, Washington, for a 150,000-gallon steel tank and tower at Corry field.

Oklahoma

BLACKWELL, OKLA.—Blackwell Zinc Co. has announced it will reopen its smelter about Jan. 1, after being idle since November, 1930.

Texas

EL PASO, TEX.—McNutt Oil & Refining Co., C. M. McNutt president, is building an oil refinery, general contract for which is let to Petroleum Engineering Co., Dallas, Tex. Cost estimated at $100,000.

Wisconsin

BEAVER DAM, WIS. — Beaver Dam Pattern Co. has applied to the

WHERE-TO-BUY

A classified list of advertisers according to products. ¶Index to advertisements gives page number of any advertiser.

ABRASIVES (Polishing)
Carborundum Co., Niagara Falls, N. Y.
Norton Co., Worcester, Mass.

ACCUMULATORS
Logemann Brothers Co., 3126 Burleigh St., Milwaukee.

ACETYLENE
Linde Air Products Co., 30 E. 42nd St., New York City.

ACIDS (Pickling)
American Chemical Paint Co., Ambler, Pa.

AIR COMPRESSORS—See COMPRESSORS (Air)

ALLOYS—See FERROALLOYS

ANGLES, CHANNELS—See STEEL (Structural)

ARBORS
Morse Twist Drill & Machine Co., New Bedford, Mass.

AXLES
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.

BABBITT METAL
Cadman, A. W., Mfg. Co., 2816 Smallman St., Pittsburgh, Pa.

BALING PRESSES
Logemann Brothers Co., 3126 Burleigh St., Milwaukee.

BANDS (Iron and Steel)
Bethlehem Steel Co., Bethlehem, Pa.
Corrigan, McKinney Steel Co. 3100 E. 45th St., Cleveland, O.

BAR BENDERS
Kardong Bros., 346 Buchanan St., Minneapolis, Minn.

BARGES (Steel)
American Bridge Co., Frick Bldg., Pittsburgh, Pa.
McClintic-Marshall Corp., Bethlehem, Pa.

BARS (Alloy)
Bethlehem Steel Co., Bethlehem, Pa.
Crucible Steel Co. of America, 17 E. 42d St., New York City
Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.
Republic Steel Corp., Youngstown, O.

BARS (Concrete Reinforcing)
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Republic Steel Corp., Youngstown, O.

BARS (Iron)—See IRON (Bar)

BARS (Steel)
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Corrigan, McKinney Steel Co. 3100 E. 45th St., Cleveland, O.
Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.
Inland Steel Co., 38 So. Dearborn St., Chicago, Ill.
Jones & Laughlin Steel Corp., Jones & Laughlin Bldg., Pittsburgh, Pa.
Republic Steel Corp., Youngstown, O.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Tennessee Coal, Iron & Railroad Co., Brown-Marx Bldg., Birmingham, Ala.
Timken Roller Bearing Co., The, Canton, O.
Weirton Steel Co., Weirton, W. Va.
Youngstown Sheet & Tube Co., Youngstown, O.

BEAMS, CHANNELS, ANGLES, ETC.
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.
Inland Steel Co., 38 So. Dearborn St., Chicago, Ill.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Weirton Steel Co., Weirton, W. Va.

BEARINGS (Ball)
Bantam Ball Bearing Co., The, South Bend, Ind.

BEARINGS (Journal)
Timken Roller Bearing Co., The, Canton, O.

BEARINGS (Roller)
Bantam Ball Bearing Co., The, South Bend, Ind.
Timken Roller Bearing Co., The, Canton, O.

BEARINGS (Thrust)
Timken Roller Bearing Co., The, Canton, O.

BENDING AND STRAIGHTENING MACHINES
Kardong Bros., 346 Buchanan St., Minneapolis, Minn.
Logemann Bros. Co., 3126 Burleigh St., Milwaukee.
Thomas Spacing Machine Co., Fulton Bldg., Pittsburgh, Pa.

BENZOL AND TOLUOL RECOVERY PLANTS
Koppers Construction Co., 1301 Koppers Bldg., Pittsburgh.

BILLETS (Alloy and Carbon Steel)
Alan Wood Steel Co., Conshohocken, Pa.
Republic Steel Corp., Youngstown, O.
Washburn Wire Co., Phillipsdale, R. I.

BILLETS (Forging)
Heppenstall Co., 47th and Hatfield Sts., Pittsburgh, Pa.
Midvale Co., The, Nicetown, Philadelphia, Pa.

BILLETS AND BLOOMS
Alan Wood Steel Co., Conshohocken, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Corrigan, McKinney Steel Co. 3100 E. 45th St., Cleveland, O.
Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.
Inland Steel Co., 38 So. Dearborn St., Chicago, Ill.

BLAST FURNACE SPECIALTIES
Bailey, Wm. M., Co., 702 Magee Bldg., Pittsburgh, Pa.

BLAST FURNACES—See FURNACES (Blast)

BLOWERS
General Electric Co., Schenectady, N. Y.
Coppus Engineering Corp., 359 Park Ave., Worcester, Mass.

BOILER HEADS
Bethlehem Steel Co., Bethlehem, Pa.

BOILER TUBES—See TUBES (Boiler)

BOLTS
Bethlehem Steel Co., Bethlehem, Pa.
Clark Bros. Bolt Co., Ridge Rd., Milldale, Conn.
Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.
Oliver Iron & Steel Corp., S. 10th & Muriel Sts., Pittsburgh, Pa.
Republic Steel Corp., Cleveland, O.

BRAKES (Electric)
Electric Controller & Mfg. Co., The, 2698 E. 79th St., Cleveland, O.

BRICK (Fire Clay)
Eureka Fire Brick Works, 1015 House Bldg., Pittsburgh, Pa.

BRICK (Insulating)—See INSULATING BRICK

BRICK (Silicon Carbide)
Carborundum Co., Perth Amboy, N. J.
Norton Co., Worcester, Mass.

BRIDGE CRANES (Ore and Coal Handling)
Wellman Engineering Co., 7000 Central Ave., Cleveland, O.

BRIDGES, BUILDINGS, VIADUCTS, STACKS
American Bridge Co., Frick Bldg., Pittsburgh, Pa.
Belmont Iron Works, 22nd & Washington Ave., Philadelphia, Pa.
McClintic-Marshall Corp., Bethlehem, Pa.
Truscon Steel Co., Youngstown, O.

BUCKETS (Clam Shell, Dragline, Grab, Single Line)
Wellman Engineering Co., 7000 Central Ave., Cleveland, O.

BUILDINGS (Steel)—See BRIDGES, ETC.

BULLDOZERS
Logemann Bros. Co., 3126 Burleigh St., Milwaukee.

BURNERS (Acetylene)—See TORCHES & BURNERS

BURNERS (Automatic)
American Heat Economy Bureau Inc., Wabash Bldg., Pittsburgh, Pa.
Ohio Valley Clay Co., Steubenville, Ohio.

BURNERS (Fuel, Oil, Gas, Combination)
Ohio Valley Clay Co., Steubenville, Ohio.

BURNERS (Luminous Flame)
Ohio Valley Clay Co., Steubenville, Ohio.

BY-PRODUCT PLANTS
Koppers Construction Co., 1301 Koppers Bldg., Pittsburgh, Pa.

CAP SCREWS—See SCREWS (Cap, Set, Safety)

CARBIDE
Linde Air Products Co., 30 E. 42nd St., New York City

CAR DUMPERS
Wellman Engineering Co., 7000 Central Ave., Cleveland, O.

CARS (Industrial and Mining)
Atlas Car & Mfg. Co., 1140 Ivanhoe Rd., Cleveland.
Bethlehem Steel Co., Bethlehem, Pa.

CASTINGS (Acid Resisting)
Cadman, A. W., Mfg. Co., 2816 Smallman St., Pittsburgh, Pa.
International Nickel Co., 67 Wall St., New York City.

CASTINGS (Alloy Steel)
American Steel Foundries, 410 No. Michigan Ave., Chicago, Ill.
Bethlehem Steel Co., Bethlehem, Pa.
Birdsboro Steel Fdry. & Mach. Co., Birdsboro, Pa.

CASTINGS (Brass, Bronze, Copper, Aluminum)
Bethlehem Steel Co., Bethlehem, Pa.
Cadman, A. W., Mfg. Co., 2816 Smallman St., Pittsburgh, Pa.

CASTINGS (Electric Steel)
Pittsburgh Electric Furnace Corp., P. O. Box 1125, Pittsburgh, Pa.
West Steel Casting Co., 805 E. 70th St., Cleveland, O.

CASTINGS (Gray Iron)
Bethlehem Steel Co., Bethlehem, Pa.
Midvale Co., The, Nicetown, Philadelphia, Pa.
National Roll & Foundry Co., The, Avonmore, Pa.

CASTINGS (Heat Resisting)
Driver-Harris Co., Harrison, N. J.

CASTINGS (Malleable)
Peoria Malleable Castings Co., Peoria, Ill.

CASTINGS (Manganese Steel)
Commercial Steel Casting Co., Marion, Ohio.

Wisconsin public service commission for permission to issue $50,000 in common stock, the proceeds to be used for expansion of the business and purchase of additional machinery and raw materials.

BEAVER DAM, WIS.—Releases of orders by automotive and other customers of Western Malleables Inc., manufacturer of malleable castings, to keep its plant busy until after Jan. 1. H. L. Kirsh is general manager. This is an unusual situation, December ordinarily being less active than other months.

BEAVER DAM, WIS.—Hutter Construction Co., Fond du Lac, Wis., has been given the general contract for complete rehabilitation of the L. Ziegler Brewing Co. plant here at a cost of about $75,000. Substantial machinery replacements will be made.

MILWAUKEE—Plant of the National Plating Co. Inc., 325 North Eighth street, recently damaged about $5000 by fire, is undergoing thorough repairs and will reopen shortly on full production.

MILWAUKEE—Pabst Corp., successor to the Pabst Brewing Co., has announced plans for expenditure of about $1,000,000, pending legalization of beer. Contracts are to be let at once for 250 vats of 400 barrels capacity each, costing about $250,000.

MILWAUKEE—Gueder, Paeschke & Frey Co. is undertaking extensive improvements in its enameling department to meet needs of a recently added department to produce filling station equipment. Some new equipment will be installed.

MILWAUKEE — Workrite Specialty Co., 3129 North Twenty-eighth street, is putting into quantity production a new type of humidifier for the home. Castings are being purchased, the company doing machining and assembling. John G. Zummach is president.

STEVENS POINT, WIS.—Steve Kubisiak, Wisconsin Rapids, Wis., and his brother, Peter Kubisiak, Chicago, expert machinists, have established a machine shop here at 201 Normal avenue.

Iowa

MARION, IOWA—City of Marion, E. E. Parsons, clerk, plans construction of a gas plant and distribution system. Howard R. Green Co., 417 First avenue, Cedar Rapids, Iowa, is engineer.

Pacific Coast

LOS ANGELES — Approximate quantities of material and equipment for the Colorado river aqueduct for the Metropolitan Water District of Southern California are as follows, including about 240,000 tons of steel: 780 carloads of structural steel; 2500 carloads of reinforcing steel; 340 carloads of copper; 16 carloads of sheet copper; 1700 carloads of timber; 200 miles of rails; 218,000 feet of steam pipe; 6,000,000 barrels of cement; 41,000,000 pounds of powder; 135 power shovels; 223 trucks; 62 tunnel blowers; 2048 mine cars; 86 air compressors; 489 rock drills; 108 electric locomotives.

HOQUIAM, WASH.—Lamb Tractor Co. is planning prompt resumption of manufacturing of tractors, including several units for its rental fleet.

SEATTLE, WASH.—Union Oil Co. will build three steel oil-storage tanks and a concrete firewall at its plant at 3001 Western avenue.

YAKIMA, WASH.—County commissioners have agreed to proceed with construction of four bridges, estimated to cost $100,000, financed by general obligation bonds. Bids will be called soon.

KETCHIKAN, ALASKA—Lighthouse department will open bids Jan. 3 for a hand-operated traveling crane and runway and a structural steel and sheet steel buoy shed at the local depot.

Dominion of Canada

VANCOUVER, B. C.—Vancouver harbor board will start work shortly extending Lapointe pier 300 feet, making it 1100 feet long, and will build trackage for 250 grain cars.

VANCOUVER, B. C.—Bids will be received until Jan. 4 by Greater Vancouver water district for furnishing material and fabricating 3980 feet of 60-inch inside diameter electric welded steel pipe of equal footage of 56-inch inside diameter steel cylinder reinforced concrete pipe.

LONDON, ONT.—Noel E. S. Pettit will build a pattern shop at 920 Dufferin avenue for the manufacture of foundry patterns.

TORONTO, ONT.—Products of the Portable Machinery Co., York, Pa., manufacturer of portable conveyors and allied equipment, are now being produced in the plant of the Dodge Mfg. Co. Ltd., 58 Pelham avenue, for Canadian and British Empire trade. Sales are being handled by the Dodge company.

TWEED, ONT.—Fire has caused damage of $100,000 to the main building of the Gordon Steel Works.

WALKERVILLE, ONT.—Superior Piston Rings Co. of Canada Ltd. has been incorporated with 1000 shares no par value, by Neil McPhee, Walkerville, Ont.

NORANDA, QUE.—Noranda Mines Ltd. plans to spend $575,000 to improve its plants, including ore concentration, mill and smelter plants. The first unit of this program is complete.

New Trade Publications

LOCK-NUT—A folder of the Cadillac Bolt & Nut Co., Cadillac, Mich., describes and illustrates a lock-nut of certified malleable iron.

STOKER—Combustion Engineering Corp., 200 Madison Avenue, New York, describes and illustrates a stoker unit equipped with dump grates in a recent bulletin. Data are presented on principal dimensions and sizes.

CLAMPS — Carson-Cadillac Corp., Cadillac, Mich., describes its bell joint clamps for cast iron pipe in a recent bulletin. Rigidity, simplicity and adaptability are features claimed for the clamp.

REFRACTORY CEMENT — Charles Taylor Sons Co., Cincinnati, has published a bulletin discussing uses of its refractory cement in laying fire brick in industrial furnaces. The cement may be used for trowelled joints, dipped joints, wash coatings and patching.

OIL BURNERS — Enterprise Oil Burner Co., San Francisco, Calif., has published a bulletin describing and illustrating three types of oil burners, one for cheap fuel oil, the second for lighter oil, and a third for heavy oil.

WELDING ELECTRODES—General Electric Co., Schenectady, N. Y., in bulletin GEA-1546A describes and illustrates its line of welding electrodes and accessories. Accessories include welding helmets, welding table and electrode holders.

REDUCERS—Integral, flexible and all-motor types of motoreducers are discussed and illustrated in Bulletin No. 260 recently published by the Falk Corp., Milwaukee. Special features of design and instructions on how to select motoreducers also are discussed.

BLAST NOZZLES—Long Lyfe abrasive blast nozzles are described in a recent bulletin of the American Foundry Equipment Co., Mishawaka, Ind. It is pointed out that the type of nozzle described usually lasts from 300 to 500 hours of steady use. It has an alloy liner or core claimed to have practically diamond hardness, with a high resistance to abrasive wear.

BRONZE ALLOY — Shenango-Penn Mold Co., Dover, O., has published the second edition of loose-leaf sheets designed to present information regarding centrifugal cast alloys. The information includes tables of melting points and weights of metals, bearing pressures for various classes of bearing and various characteristics and uses of several alloys.

WHERE-TO-BUY

CASTINGS (Steel)
Allegheny Steel Co., Brackenridge, Pa.
American Steel Foundries, 410 No. Michigan Ave., Chicago, Ill.
Bethlehem Steel Co., Bethlehem, Pa.
Birdsboro Steel Foundry & Mach. Co., Birdsboro, Pa.
Commercial Steel Casting Co., Marion, Ohio.
Mackintosh-Hemphill Co., Penn Ave. at Water St., Pittsburgh, Pa.
Mesta Machine Co., P. O. Box 1124, Pittsburgh, Pa.
Midvale Co., The, Nicetown, Philadelphia, Pa.
National Roll & Foundry Co., The, Avonmore, Pa.
West Steel Casting Co., 805 E. 70th St., Cleveland.

CASTINGS (Worm & Gear Bronze)
Cadman, A. W., Mfg. Co., 2816 Smallman St., Pittsburgh, Pa.

CASTORS (Plate Mills)—See PLATE CASTORS

CEMENT (High Temperature)
Carborundum Co., Perth Amboy, N. J.

CHROME ORE
Samuel Frank, & Co., Inc., Harrison Bldg., Philadelphia.

CHROMIUM METAL
Electro Metallurgical Sales Corp., 30 E. 42nd St., New York City.

CLEANING SPECIALTIES
American Chemical Paint Co., Ambler, Pa.

COAL AND COKE
Alan Wood Steel Co., Conshohocken, Pa.
Cleveland-Cliffs Iron Co., Union Trust Bldg., Cleveland, O.
Hanna Furnace Corp., The, Buffalo, N. Y.
Interlake Iron Corp., Union Trust Bldg., Cleveland, O.
Oglebay, Norton & Co., Hanna Bldg., Cleveland, O.
Pickands, Mather & Co., Union Trust Bldg., Cleveland, O.
Shenango Furnace Co., Oliver Bldg., Pittsburgh, Pa.
Tennessee Coal, Iron & Railroad Co., Brown-Marx Bldg., Birmingham, Ala.

COKE—See COAL AND COKE

COKE OVEN MACHINERY
Atlas Car & Mfg. Co., 1140 Ivanhoe Rd., Cleveland.
Wellman Engineering Co., 7000 Central Ave., Cleveland, O.

COKE OVENS (By-Product)
Koppers Construction Co., 1301 Koppers Bldg., Pittsburgh.

COMPENSATORS (Automatic)
Electric Controller & Mfg. Co., 2698 E. 79th St., Cleveland, O.

COMPRESSORS (Air)
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Curtis Pneumatic Machinery Co., 1996 Kienlen Ave., St. Louis, Mo.
General Electric Co., Schenectady, N. Y.

CONCRETE REINFORCING BARS—See BARS (Concrete Reinforcing)

CONDENSERS (Surface, Barometric, Multi-Jet)
Allis-Chalmers Mfg. Co., Milwaukee, Wis.

CONDUITS (Electric)
Youngstown Sheet & Tube Co., Youngstown, O.

CONTRACTORS—See ENGINEERS AND CONTRACTORS

CONTROLLERS (Electric)
Electric Controller & Mfg. Co., 2698 E. 79th St., Cleveland, O.

CONVEYOR BELTS (High & Low Temperature)
Wickwire Spencer Steel Co., 41 E. 42nd St., New York City.

COOLING EQUIPMENT
Coppus Engineering Corp., 359 Park Ave., Worcester, Mass.

COTTER PINS
Hindley Mfg. Co., Valley Falls, R. I.

COUPLINGS (Flexible)
Electric Controller & Mfg. Co., 2698 E. 79th St., Cleveland, O.

CRANES (Charging)
Alliance Machine Co., The, Alliance, O.
Harnischfeger Corp., 4411 W. National Ave., Milwaukee, Wis.
Morgan Engineering Co., Alliance, O.

CRANES (Creeper, Erection)
Harnischfeger Corp., 4411 W. National Ave., Milwaukee, Wis.

CRANES (Electric)
Alliance Machine Co., The, Alliance, O.
Harnischfeger Corp., 4411 W. National Ave., Milwaukee, Wis.
Morgan Engineering Co., Alliance, O.

CUTTING AND WELDING—See WELDING

CUTTING OILS
Sun Oil Co., 1608 Walnut St., Philadelphia, Pa.

CYLINDERS (Pressure)
National Tube Co., Frick Bldg., Pittsburgh, Pa.
Scaife, Wm. B., & Sons Co., Oakmont, Pa.

DEOXIDIZERS
Titanium Alloy Mfg. Co., The, Niagara Falls, N. Y.
Vanadium Corp. of America, 120 Broadway, New York City.

DIE BLOCKS
Bethlehem Steel Co., Bethlehem, Pa.
Heppenstall Co., 47th and Hatfield Sts., Pittsburgh, Pa.

DOORS AND SHUTTERS (Steel, Fire and Rolling)
Truscon Steel Co., Pressed Steel Div., Youngstown, O.

DRILLING MACHINES (Multiple, Heavy Duty)
Thomas Spacing Machine Co., Fulton Bldg., Pittsburgh, Pa.

DRILLING MACHINES (Radial)
Thomas Spacing Machine Co., Fulton Bldg., Pittsburgh, Pa.

DRILLS (Twist)—See TWIST DRILLS

DRIVES (Cut Herringbone Gears)
Lewis Foundry & Machine Co., P. O. Box 1591, Pittsburgh, Pa.
Mesta Machine Co., P. O. Box 1124, Pittsburgh, Pa.

DRIVES (Multi V-Belt)
Allis-Chalmers Mfg. Co., Milwaukee, Wis.

DUST ARRESTOR EQUIPMENT
American Foundry Equipment Co., Mishawaka, Ind.

ELECTRICAL EQUIPMENT
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Electric Controller & Mfg. Co., 2698 E. 79th St., Cleveland, O.
General Electric Co., Schenectady, N. Y.

ELECTRIC HEATING ELEMENTS
Globar Corp., Niagara Falls, N. Y.

ELECTRIC WELDING (See Welding)

ENGINEERS AND CONTRACTORS
Laughlin, Alex, & Co., First National Bk. Bldg., Pittsburgh, Pa.
Wean Engineering Co., Warren, Ohio.
Wellman Engineering Co., 7000 Central Ave., Cleveland, O.

ENGINEERS (Consulting)
Freyn Engineering Co., 310 S. Michigan Ave., Chicago, Ill.
Perin Engineering Co., Inc., 11 West 42nd St., New York City.

ENGINEERS, CONSULTING (By-Product Coke Oven & Gas Plants)
Koppers Construction Co., 1301 Koppers Bldg., Pittsburgh.

FACING MACHINES (Structural)
Thomas Spacing Machine Co., Fulton Bldg., Pittsburgh, Pa.

FANS (Portable)
Coppus Engineering Corp., 359 Park Ave., Worcester, Mass.
Perkins, B. F., & Son, Inc. Holyoke, Mass.

FERROALLOYS
Cleveland-Cliffs Iron Co., Union Trust Bldg., Cleveland, O.
Electro Metallurgical Sales Corp., 30 E. 42nd St., New York City.
International Nickel Co., 67 Wall St., New York City.
Oglebay, Norton & Co., Hanna Bldg., Cleveland, O.
Titanium Alloy Mfg. Co., The, Niagara Falls, N. Y.
Vanadium Corp. of America, 120 Broadway, New York City.

FERROCARBON (Titanium)
Titanium Alloy Mfg. Co., Niagara Falls, N. Y.

FERROCHROME
Oglebay, Norton & Co., Hanna Bldg., Cleveland, O.
Vanadium Corp. of America, 120 Broadway, New York City.

FERROMANGANESE
Oglebay, Norton & Co., Hanna Bldg., Cleveland, O.
Samuel, Frank, & Co., Inc., Harrison Bldg., Philadelphia, Pa.

FERROPHOSPHORUS
Oglebay, Norton & Co., Hanna Bldg., Cleveland, O.

FERROSILICON
Oglebay, Norton & Co., Hanna Bldg., Cleveland, O.
Vanadium Corp. of America, 120 Broadway, New York City.

FERROSILICON (Aluminum)
Vanadium Corp. of America, 120 Broadway, New York City.

FERROTUNGSTEN
Electro Metallurgical Sales Corp., 30 East 42nd St., New York City.
Vanadium Corp. of America, 120 Broadway, New York City.

FERROVANADIUM
Vanadium Corp. of America, 120 Broadway, New York City.

FLASKS (Foundry)
Truscon Steel Co., Youngstown, O.

FLOORING (Steel)
Alan Wood Steel Co., Conshohocken, Pa.
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Central Iron & Steel Co., Harrisburg, Pa.
Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.

FLOORS
Union Products Co., 1252 W. 70th St., Cleveland, O.

FLUORSPAR
Oglebay, Norton & Co., Hanna Bldg., Cleveland, O.

FORGING BILLETS—See BILLETS (Forging)

FORGING (Brass, Bronze, Copper)
Revere Copper & Brass, Inc., 230 Park Ave., New York City.

FORGINGS (Drop)
Bethlehem Steel Co., Bethlehem, Pa.
Fruin Drop Forge Co., 341-355 W. Root St., Chicago.

FORGINGS (Iron and Steel)
Heppenstall Co., 47th and Hatfield Sts., Pittsburgh, Pa.
Mesta Machine Co., P. O. Box 1124. Pittsburgh, Pa.
Midvale Co., The, Nicetown, Philadelphia, Pa.

FORGINGS (Upset)
Bethlehem Steel Co., Bethlehem, Pa.

FROGS AND SWITCHES
Bethlehem Steel Co., Bethlehem, Pa.

FURNACE CONTROLS (Open Hearth)
Morgan Construction Co., Worcester, Mass.

FURNACE INSULATION—See INSULATION

FURNACES (Blast)
Freyn Engineering Co., 310 S. Michigan Ave., Chicago. Ill.
McClintic-Marshall Corp., Bethlehem, Pa.

FURNACES (Electric Heating)
Electric Furnace Co., The, Wilson St., Salem, O.
General Electric Co., Schenectady, N. Y.
Holcroft & Co., 6545 Epworth Blvd., Detroit, Mich.
Strong, Carlisle & Hammond Co., 1392 W. 3rd St., Cleveland, O.

FURNACES (Electric Melting)
Ajax Electrothermic Corp., Trenton, N. J.
American Bridge Co., Frick Bldg., Pittsburgh, Pa.
General Electric Co., Schenectady, N. Y.
Pittsburgh Electric Furnace Corp., P. O. Box 1125, Pittsburgh, Pa.

FURNACES (Forging)
Holcroft & Co., 6545 Epworth Blvd., Detroit, Mich.

FURNACES (Open-Hearth)
Criswell, James, Co., Keenan Bldg., Pittsburgh.
Laughlin, Alex, & Co., First National Bk. Bldg., Pittsburgh, Pa.

FURNACES (Recuperative)
Electric Furnace Co., The, Wilson St., Salem, O.

FURNACES (Sheet and Tin Mill)
Wean Engineering Co., Warren, Ohio.

FURNACES (Steel Mill)
Electric Furnace Co., The, Wilson St., Salem, O.
General Electric Co., Schenectady, N. Y.
Holcroft & Co., 6545 Epworth Blvd., Detroit, Mich.
Morgan Construction Co., Worcester, Mass.

FURNACES (Steel Treating, Annealing & Case Hardening)
Carborundum Co., Perth Amboy, N. J.
Electric Furnace Co., The, Wilson St., Salem, O.
General Electric Co., Schenectady, N. Y.
Holcroft & Co., 6545 Epworth Blvd., Detroit, Mich.
Strong, Carlisle & Hammond Co., 1392 W. 3rd St., Cleveland, O.

GALVANIZING PLANTS FOR SHEETS
Wean Engineering Co., Warren, Ohio.

WHERE-TO-BUY

GAS HOLDERS
McClintic-Marshall Corp., Bethlehem, Pa.

GAS METERS—See METERS (Gas and Air)

GAS PRODUCER PLANTS
Flinn & Dreffein Co., 308 W. Washington St., Chicago.
Koppers Construction Co., 1301 Koppers Bldg., Pittsburgh.
Morgan Construction Co., Worcester, Mass.
Semet-Solvay Engineering Co., 40 Rector St., New York, N. Y.
Wellman Engineering Co., 7000 Central Ave., Cleveland, O.

GAS RECOVERY COKE OVEN & GAS PLANTS
Koppers Construction Co., 1301 Koppers Bldg., Pittsburgh.
Semet-Solvay Engineering Co., 40 Rector St., New York, N. Y.

GAUGES (Indicating and Recording)
General Electric Co., Schenectady, N. Y.

GEAR BLANKS
Bethlehem Steel Co., Bethlehem, Pa.

GEARS AND GEAR CUTTING
General Electric Co., Schenectady, N. Y.
Lewis Foundry & Machine Co., P. O. Box 1591, Pittsburgh, Pa.
Mackintosh-Hemphill Co., Penn Ave. at Water St., Pittsburgh, Pa.
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Bliss & Laughlin, Inc., Harvey, Ill.
Jones & Laughlin Steel Corp., Jones & Laughlin Bldg., Pittsburgh, Pa.
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Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.
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Ryerson, Jos. T., & Sons, Inc., 16th & Rockwell Sts., Chicago, Ill.
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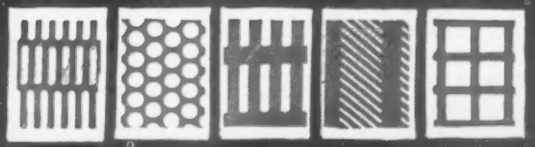
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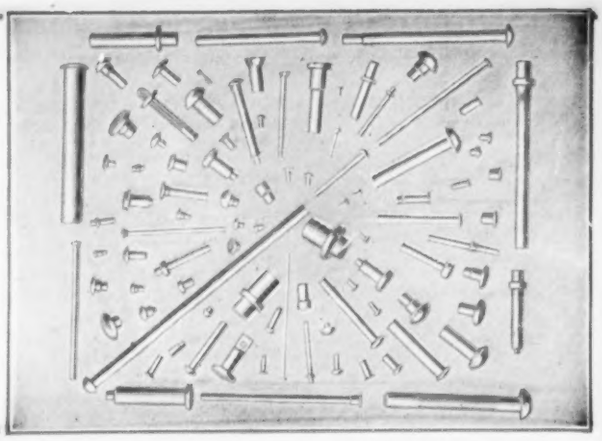

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Quality rivets and studs from all grades of materials to order only for other manufacturers.

Progressive Manufactured Products are made on both a quality and price basis, their uniformity of construction insures you against slowing down in your assembly operation.

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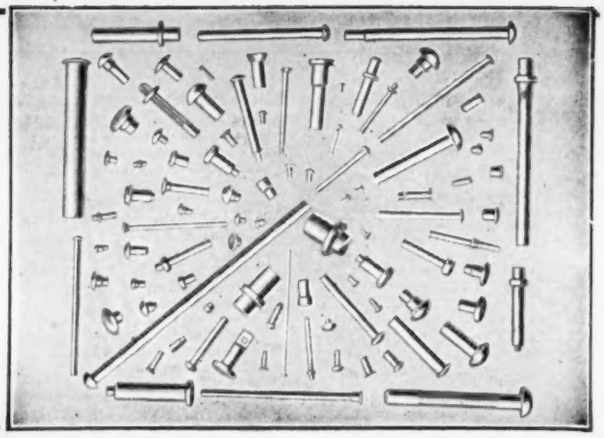
Interchangeable bolts and nuts made strictly to A.S.M.E. tolerances.



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Malleable Iron Castings
DETACHABLE SPROCKET CHAIN
Peoria Malleable Casting Co.
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SMALL ELECTRIC STEEL CASTINGS
(Capacity 500 Tons per Month)

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BUILT BY HOLCROFT & COMPANY DETROIT-MICH.

LEADERS IN BUILDING AND DESIGNING ELECTRIC AND COMBUSTION FURNACES, KILNS AND OVENS.
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INVESTIGATE ELECTRIC HEAT

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80% Ferro-Manganese Electrolytic	Pig Iron Low Phos English French	Muck Bars Low Phos American Swedo Iron Co.'s
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AMERICAN STEEL FOUNDRIES
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1 lb. to 10 ton
OPEN HEARTH STEEL CASTINGS
THE COMMERCIAL STEEL CASTING COMPANY
MARION, OHIO

CLASSIFIED

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NORTH WALES MACHINE CO., INC., North Wales. Gray iron, nickel alloy gray iron, semi-steel superior quality, machine or hand molded, sand blasted or tumbled.

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For all classes of advertising except Positions Wanted, the rate is

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Three to Six Insertions—48c per line
Six or More Insertions—45c per line

Seven words of ordinary length make a line.

First line is bold face type.

A box number address counts as one line.

Positions Wanted advertisements are 25 cents per line.

Those desiring to give special prominence to their advertisements may buy space by the inch and have their advertisements appear in bold face type with white space at top and bottom, at the following rates:

Single Column 2¼" Wide	1 Time	3 Times	6 Times	13 Times
1"	$ 5.00	$ 4.80	$ 4.60	$ 4.40
2"	9.50	9.00	8.75	8.25
3"	14.00	13.50	12.75	12.25
4"	18.00	17.25	16.50	15.75
5" (⅓ col.)	22.00	21.25	20.25	19.25
6"	26.00	25.00	24.00	22.75
7"	30.00	28.75	27.50	26.50
8" (¼ pg.)	34.00	32.50	31.25	30.00
10"	41.50	39.75	38.25	37.50
15" (⅓ pg.)	64.00	61.50	59.00	56.50
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30" (1 pg.)	120.00	116.00	112.00	108.00

Count 10 lines to the inch for actual type matter and allow accordingly when white space is desired. Advertising copy should reach us Wednesday prior to date of issue. STEEL is issued weekly on Monday.

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IF YOU ARE OPEN TO OVERTURES FOR new connection and qualified for a salary between $2,500 and $25,000, your response to this announcement is invited. The undersigned provides a thoroughly organized service, of recognized standing and reputation, through which preliminaries are negotiated confidentially for position of the calibre indicated. The procedure is individualized to each client's personal requirements; your identity covered and present position protected. Established twenty-three years. Send only name and address for details. R. W. Bixby, Inc., 110 Delward Building, Buffalo.

ENGINEERING POSITIONS—SPECIALIZING in replacement of Executives, Sales Managers, Sales Engineers, Production Engineers, Designers, Draftsmen, Tracers and Technical men for various office, plant and Field engineering positions; also Architects, Purchasing Agents, Teachers, Chemists and Employment Managers. If qualified and experienced please call or write for blank. Cleveland Engineering Agency, 219 Huron-Ninth Bldg., Cleveland, Ohio.

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Koppers Construction Co.
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—for location of these and other advertisements see opposite page.

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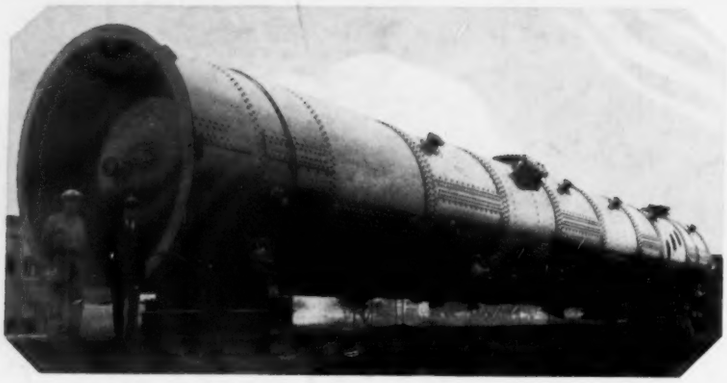

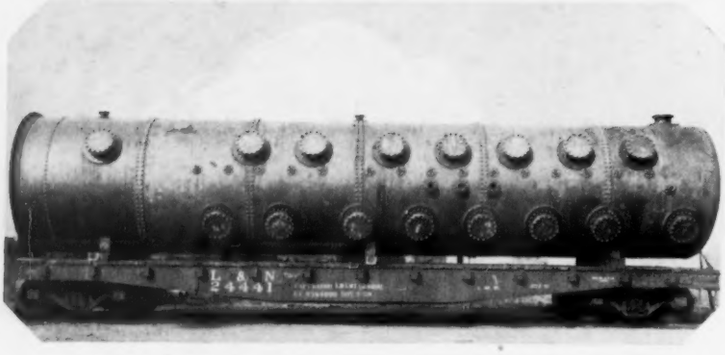

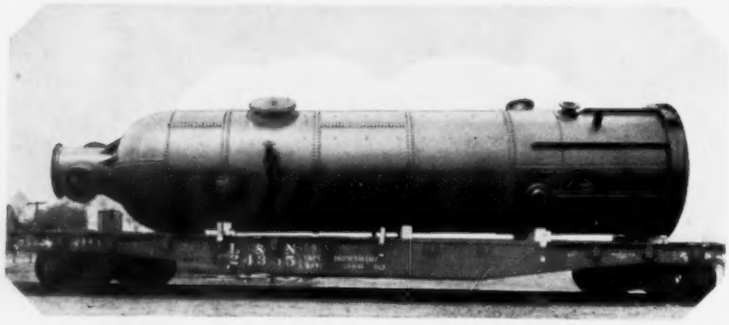

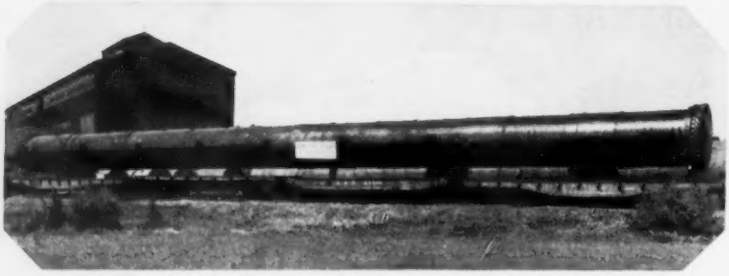

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Oil Well Supply Company
The Lorain Steel Company
Tennessee Coal, Iron & R. R. Company
Universal Atlas Cement Company

Pacific Coast Distributors—Columbia Steel Company, Russ Building, San Francisco, Calif. *Export Distributors*—United States Steel Products Company, 30 Church Street, New York, N. Y.